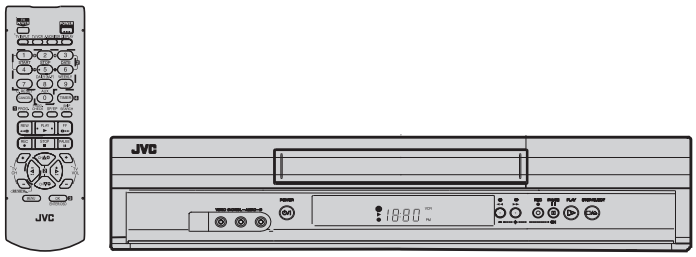
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J692Us,HR-J692Uc



VHS Hi-Fi SQPB

For disassembling and assembling of MECHANISM ASSEMBLY, refer to the SERVICE MANUAL No.86700 (MECHANISM ASSEMBLY).

SPECIFICATION

GENERAL

Power requirement	:	AC 120 V ~, 60 Hz
Power consumption		
Power on	:	13 W
Power off	:	1.5 W
Temperature		
Operating	:	5°C to 40°C (41°F to 104°F)
Storage	:	-20°C to 60°C (-4°F to 140°F)
Operating position	:	Horizontal only
Dimensions (W x H x D)	:	435 mm x 94 mm x 248 mm (17-3/16" x3-3/4"x9-3/4")
Weight	:	2.7 kg (5.9 lbs)
Format	:	VHS NTSC standard
Maximum recording time		
SP	:	210 min. with ST-210 video cassette
EP	:	630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	:	NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording/Playback system	:	DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	:	45 dB
Horizontal resolution	:	230 lines
Frequency range		
Normal audio	:	70 Hz to 10,000 Hz
Hi-Fi audio	:	20 Hz to 20,000 Hz
Input/Output	:	RCA connectors (IN x 1, OUT x 1)

TUNER

Tuning system	:	Frequency-synthesized tuner
Channel coverage		
VHF	:	Channels 2-13
UHF	:	Channels 14-69
CATV	:	113Channels
RF output	:	Channel 3, 4 or - (off) (preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference	:	Quartz
Program capacity	:	1-year programmable timer/8 programs

ACCESSORIES

Provided accessories	:	RF cable (F-type) Infrared remote control unit Lithium battery -CR2032

Specifications shown are for SP mode unless specified otherwise. E. & O.E. Design and specifications subject to change without notice.

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SECTION 1
SAFETY PRECAUTIONS

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold.However,in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

1.1 Precautions during Servicing

(1) Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product.When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

(2) Parts identified by the ⚠symbol and shaded ( ) parts are critical for safety.
Replace only with specified part numbers.

NOTE :

Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

(3) Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

(4) Use specified internal wiring. Note especially:
- Wires covered with PVC tubing
- Double insulated wires
- High voltage leads

(5) Use specified insulating materials for hazardous live parts. Note especially:
- Insulation Tape
- PVC tubing
- Spacers
- Insulation sheets for transistors
- Barrier

(6) When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

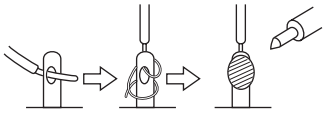


Fig.1

(7) Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

(8) Check that replaced wires do not contact sharp edged or pointed parts.

(9) When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

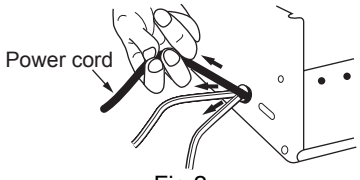


Fig.2

(10) Also check areas surrounding repaired locations.

(11) Products using cathode ray tubes (CRTs) In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits.Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

(12) Crimp type wire connector
In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
- **Connector part number** :E03830-001
- **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
- **Replacement procedure**
  a) Remove the old connector by cutting the wires at a point close to the connector.
  Important : Do not reuse a connector (discard it).

Fig.3

b) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

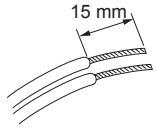


Fig.4

c) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

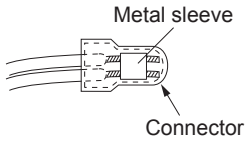


Fig.5

d) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

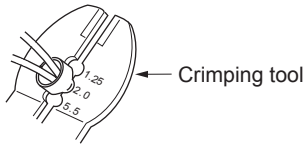


Fig.6

e) Check the four points noted in Fig.7.

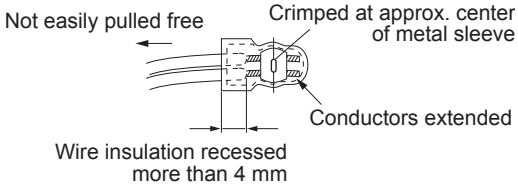

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

1.2 Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

(1) Insulation resistance test
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
See Fig.11 below.

(2) Dielectric strength test
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See Fig.11 below.

(3) Clearance distance
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See Fig.11 below.

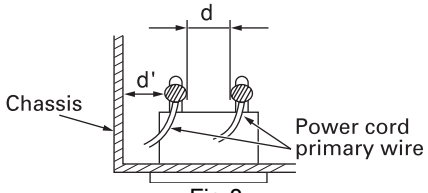


Fig.8

(4) Leakage current test
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
Measuring Method : (Power ON)
Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See Fig.9 and following Fig12.

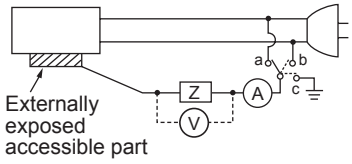
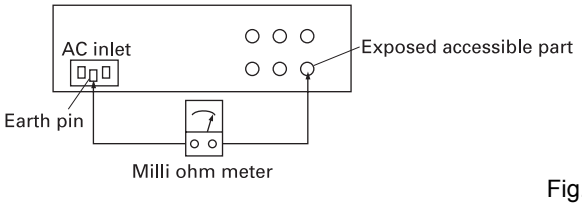


Fig.9

(5) Grounding (Class I model only)
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
Measuring Method:
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See Fig.10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

Fig.10

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦ R ≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Fig.11

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Fig.12

NOTE :
These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 2
DISASSEMBLY

2.1 Manually removing the cassette tape

If you cannot remove the cassette tape which is loaded because of any electrical or mechanical failures, manually remove it by taking the following steps.

(1) Unplug the power cord plug from the power outlet.

(2) Refer to the disassembly procedure of the VCR and perform the disassembly of the major parts before removing the mechanism assembly. (See Fig. 2-1a)

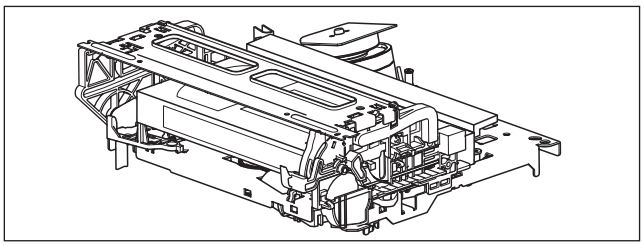


Fig.2-1a

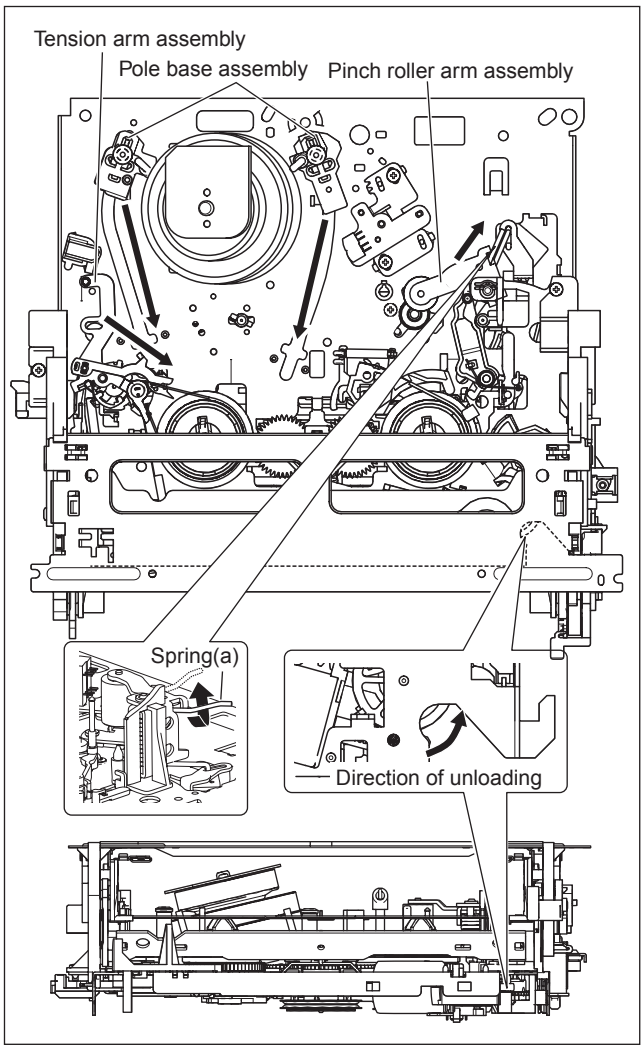


Fig.2-1b

(3) Unload the pole base assembly by manually turning the gear of the loading motor until the pole base assembly is hidden behind the cassette lid. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1b)

In case of mechanical failures, while keeping the tension arm assembly free from tension, pull out the tape on the pole base assembly. Take the spring(a) of the pinch roller arm assembly off the hook, and detach it from the tape.

(4) Remove the screw (a) of the side frame (L/R).

(5) Hold the slack tape and cassette cover together, lift the cassette tape, top frame, cassette holder and side frames (L, R) together from the rear and remove them by dis-engaging the hooks (a) and (b).

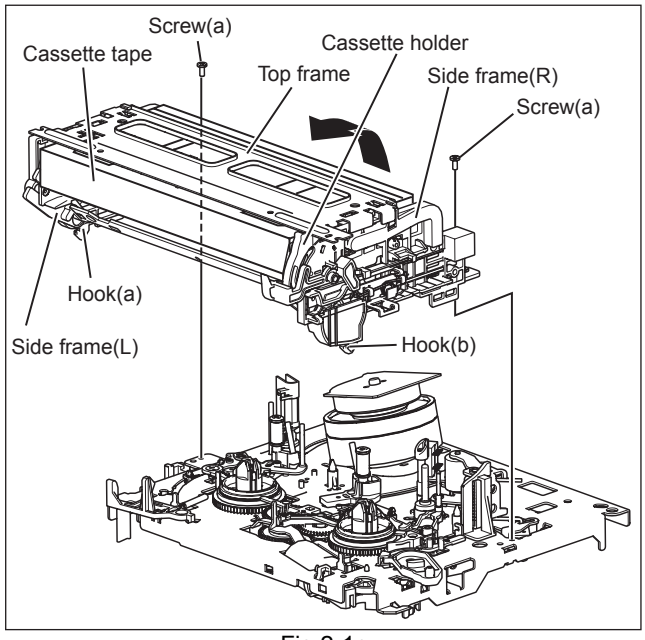


Fig.2-1c

(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

2.2 Removing the major parts

2.2.1 How to read the procedure table

This table shows the steps for disassembly of the externally furnished parts and board assemblies. Reverse these steps when re-assembling them.

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover	1-3a	4(S1a),(S1b),3(L1a), 2(SD1a),(P1a),(W1a), CN1(WR1a),	<Note 1a>
	Bracket		2(S1c)	

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order.
These numbers are also used as the identification (location) No. of parts Figures.

(2) Part name to be removed or installed.

(3) Fig. No. showing procedure or part location.

(4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered.
P= Spring, W= Washer, S= Screw, L= Locking tab, SD= Solder, CN**(WR**)= Remove the wire (WR**) from the connector (CN**).

Note:
- **The bracketed ( ) WR of the connector symbol are assigned nos. in priority order and do not correspond to those on the spare parts list.**

(5) Adjustment information for installation

2.2.2 Disassembly procedure

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover	2-2-2d	3(S1a)	
[2]	Front panel assembly	2-2-2d 2-2-2a	2(S2a), 4(L2a), 3(L2b) (L2c)	<Note 2a>
[3]	Mechanism assembly	2-2-2d	CN2001(WR3a), (S3a), (S3b)	<Note 3a> <Note 3b>
	(Drum Shield)		(S3f), (L3a)	<Note 3c>
	(Drum assembly)	2-2-2b 2-2-2c	CN1(WR3b), (S3c), (S3d), (S3e),	<Note 3d>
[4]	Main board assembly	2-2-2d	2(L4a),(L4b),(L4c)	

<Note 2a>
- When reattaching the Front panel assembly, make sure that the door opener of the Side frame (R) is lowered in position prior to the reinstallation.
- When reattaching the Front panel assembly, pay careful attention to the switch lever of the Front panel assembly not to make it touch the switch knob of the Main board assembly from the side.
- When reattaching the Front panel assembly, lift the Cassette door slightly.

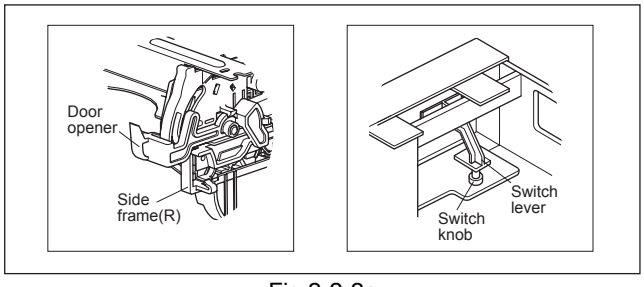


Fig.2-2-2a

<Note 3a>
- Be careful not to damage the connector and wire etc. during connection and disconnection.
- When connecting the flat wire to the connector, be careful with the flat wire direction.

<Note 3b>
- When reattaching the Mechanism assembly, secure the screws (S3a to S3b) in the order of a, b.

<Note 3c>
- When reattaching the Mechanism assembly, be sure to align the phase of the Rotary encoder on the Main board assembly.
- When reattaching the Mechanism assembly, set the “Mechanism assembling mode”. [See “MECHANISM ASSEMBLY SERVICE MANUAL (No. 86700)”.]
- When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors and switch on the Main board assembly.

<Note 3d>
- When reattaching the Drum assembly, secure the screws (S3c to S3e) in the order of c, d, e.

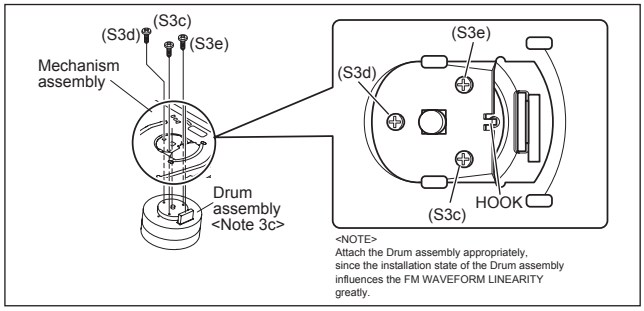


Fig.2-2-2b

- When handling the drum assembly alone, hold it by the motor or shaft. Be careful not to touch other parts, especially the video heads. Also take care not to damage the connectors.

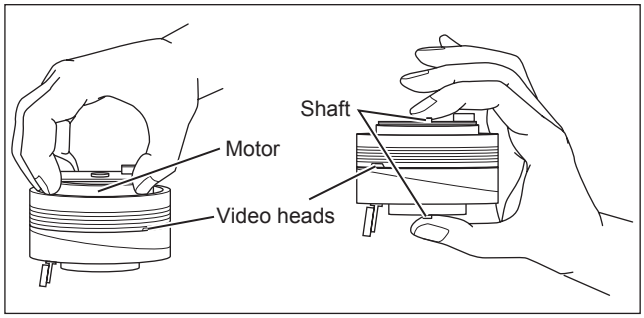


Fig.2-2-2c

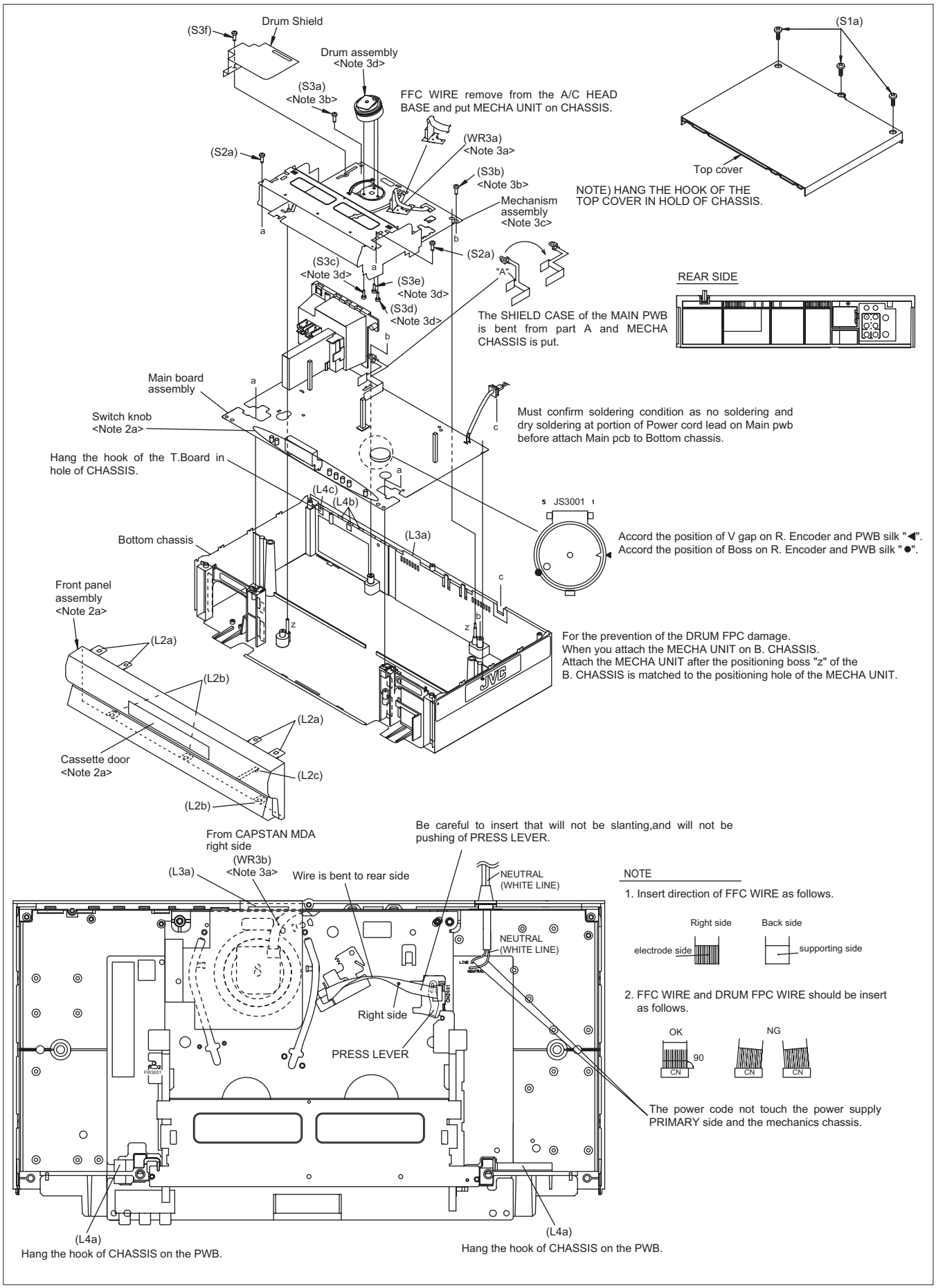

Drum Shield
(S3f)
Drum assembly
<Note 3d>
(S3a)
<Note 3b>
FFC WIRE remove from the A/C HEAD BASE and put MECHA UNIT on CHASSIS.
(WR3a)
<Note 3a>
(S2a)
(S3b)
<Note 3b>
Mechanism assembly
<Note 3c>
(S1a)
Top cover
NOTE) HANG THE HOOK OF THE TOP COVER IN HOLD OF CHASSIS.
(S3c)
<Note 3d>
(S3e)
<Note 3d>
(S3d)
<Note 3d>
(S2a)
"A"
REAR SIDE
The SHIELD CASE of the MAIN PWB is bent from part A and MECHA CHASSIS is put.
Main board assembly
Switch knob
<Note 2a>
Must confirm soldering condition as no soldering and dry soldering at portion of Power cord lead on Main pwb before attach Main pcb to Bottom chassis.
Hang the hook of the T.Board in hole of CHASSIS.
(L4c)
(L4b)
JS3001
Accord the position of V gap on R. Encoder and PWB silk "◀".
Accord the position of Boss on R. Encoder and PWB silk "●".
Bottom chassis
(L3a)
Front panel assembly
<Note 2a>
(L2a)
(L2b)
(L2a)
Cassette door
<Note 2a>
(L2c)
(L2b)
For the prevention of the DRUM FPC damage.
When you attach the MECHA UNIT on B. CHASSIS.
Attach the MECHA UNIT after the positioning boss "z" of the B. CHASSIS is matched to the positioning hole of the MECHA UNIT.
From CAPSTAN MDA right side
(WR3b)
<Note 3a>
(L3a)
Wire is bent to rear side
Be careful to insert that will not be slanting,and will not be pushing of PRESS LEVER.
NEUTRAL (WHITE LINE)
NEUTRAL (WHITE LINE)
Right side
PRESS LEVER
NOTE
1. Insert direction of FFC WIRE as follows.
Right side
Back side
electrode side
supporting side
2. FFC WIRE and DRUM FPC WIRE should be insert as follows.
OK
NG
90
CN
CN
CN
The power code not touch the power supply PRIMARY side and the mechanics chassis.
(L4a)
Hang the hook of CHASSIS on the PWB.
(L4a)
Hang the hook of CHASSIS on the PWB.

Fig.2-2-2d

2.3 Emergency display function

This unit saves details of the last two emergencies as the EMG history and allows the status of the VCR and the mechanism of each emergency to be shown both on the display and as OSD information.
When using the emergency function, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received).

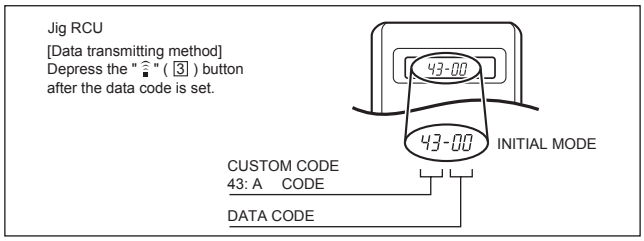


Fig.2-3a

2.3.1 Jig RCU mode

This unit uses the following two modes for receiving remote control codes.
(1) User RCU mode:Ordinary mode for use by the user.
(2) Jig RCU mode: Mode for use in production and servicing.
When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). As both of the above two modes are stored in the EEPROM, it is required to set the VCR back to the User RCU mode each time that an adjustment is made or to check that the necessary operations have been completed.These modes can be set by the operations described below.

2.3.1.1 Setting the Jig RCU mode

(1) Unplug the power cord plug from the power outlet.
(2) Press and hold the “REC” and “PAUSE” buttons on the VCR simultaneously, while plugging the power cord plug into the power outlet.
When the VCR is set to the Jig RCU mode, the symbols (“ : ”) in the time display of the FDP are turned off.

2.3.1.2 Setting the User RCU mode

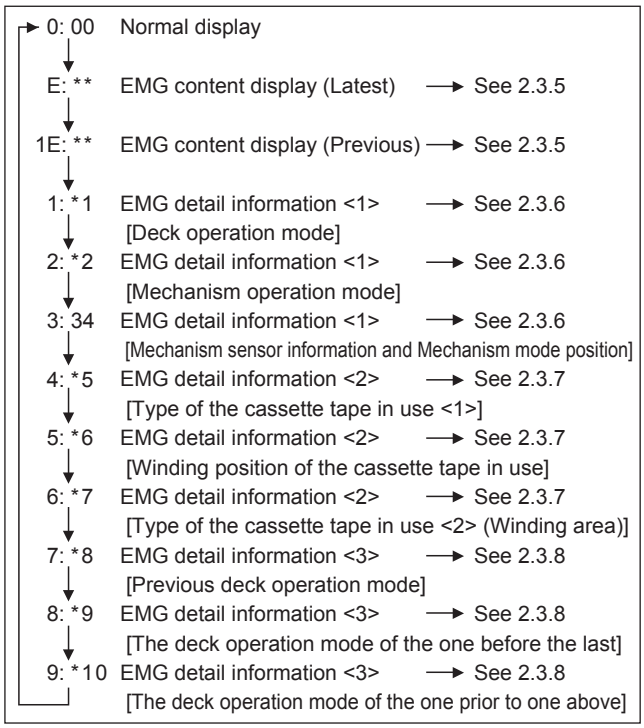
(1) Turn off the power.
(2) Press the “REC” and “PAUSE” buttons of the VCR simultaneously. Alternatively, transmit the code “80” from the Jig RCU.

2.3.2 Displaying the EMG information

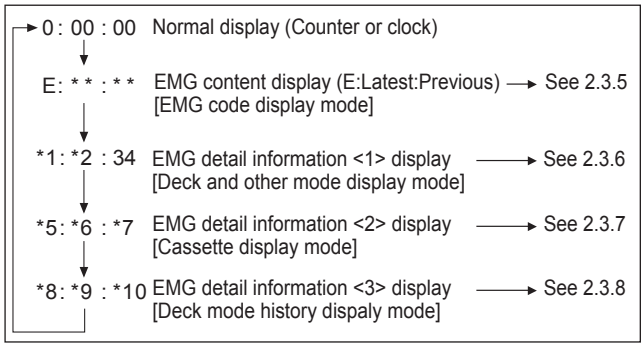
The EMG detail of information can be displayed by transmitting the code "59" from the Jig RCU.

Note:

- **The EMG detail information <1><2> show the information on the latest EMG.**
  It becomes “ – – : – – : – –” when there is no latest EMG record.


0: 00 Normal display
E: ** EMG content display (Latest) → See 2.3.5
1E: ** EMG content display (Previous) → See 2.3.5
1: *1 EMG detail information <1> → See 2.3.6
[Deck operation mode]
2: *2 EMG detail information <1> → See 2.3.6
[Mechanism operation mode]
3: 34 EMG detail information <1> → See 2.3.6
[Mechanism sensor information and Mechanism mode position]
4: *5 EMG detail information <2> → See 2.3.7
[Type of the cassette tape in use <1>]
5: *6 EMG detail information <2> → See 2.3.7
[Winding position of the cassette tape in use]
6: *7 EMG detail information <2> → See 2.3.7
[Type of the cassette tape in use <2> (Winding area)]
7: *8 EMG detail information <3> → See 2.3.8
[Previous deck operation mode]
8: *9 EMG detail information <3> → See 2.3.8
[The deck operation mode of the one before the last]
9: *10 EMG detail information <3> → See 2.3.8
[The deck operation mode of the one prior to one above]

EMG display of 7segment LED display model
Fig.2-3-1a


0 : 00 : 00 Normal display (Counter or clock)
E: * * : * * EMG content display (E:Latest:Previous) → See 2.3.5
[EMG code display mode]
*1 : *2 : 34 EMG detail information <1> display → See 2.3.6
[Deck and other mode display mode]
*5 : *6 : *7 EMG detail information <2> display → See 2.3.7
[Cassette display mode]
*8 : *9 : *10 EMG detail information <3> display → See 2.3.8
[Deck mode history dispaly mode]

EMG display of FDP display model
Fig.2-3-1b

<Reference> EMG display of FDP display mode

(1) Transmit the code “59” from the Jig RCU.
The FDP shows the EMG content in the form of “E:**:**”.

<Example 1> E : 01 : 03
Previous EMG
Latest EMG

<Example 2> E : - - : - - ← No EMG record

(2) Transmit the code “59” from the Jig RCU again.
The FDP shows the EMG detail information <1> in the form of “ *1: *2 : 34 ”.

*1 : Deck operation mode at the moment of EMG
*2 : Mechanism operation mode at the moment of EMG
3– : Mechanism sensor information at the moment of EMG
–4 : Mechanism mode position at the moment of EMG

(3) Transmit the code “59” from the Jig RCU once again.
The FDP shows the EMG detail information <2> in the form of “ *5 : *6 : *7 ”.

*5 : Type of the cassette tape in use <1> .
*6 : Winding position of the cassette tape in use
*7 : Type of the cassette tape in use <2> (Winding area)

(4) Transmit the code “59” from the Jig RCU once again.
The FDP shows the EMG detail information <3> in the form of “*8 : *9 : *10”.

*8 : Previous deck operation mode at the moment of EMG
*9 : The deck operation mode of the one before the last at the moment of EMG
*10: The deck operation mode of the one prior to one above at the moment of EMG

(5) Transmit the code “59” from the Jig RCU once again to reset the display.

2.3.3 Clearing the EMG history

(1) Display the EMG history.
(2) Transmit the code “36” from the Jig RCU.
(3) Reset the EMG display.

2.3.4 Details of the OSD display in the EMG display mode

During the EMG display, the OSD shows the data on the deck mode, etc. The details of the display contents are as follows.

Notes:

- **The display is variable depending on the part No. of the System Control microcomputer (IC3001) built into the VCR. In the following, refer to the figure carrying the same two characters as the top two characters of the part number of your IC.**
- **The sensor information in the OSD display contents is partially different from the mechanism sensor information in EMG detail information <1>.**

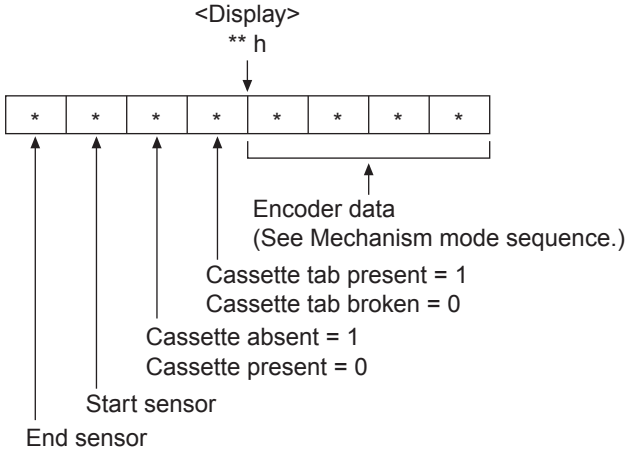
[For MN* only]

AA	BB	CC	DD	EE
FF	GG	HH	I I	J J
KK	L L	MM	NN	OO
PP	QQ	RR	SS	TT
UU	VV	WW	XX	YY

AA : Deck operation mode (See EMG detail information <1>.)
BB : Mechanism operation mode
(See EMG detail of information <1>.)
CC : Mechanism transition flag
DD : Capstan motor control status
EE : Loading motor control status
FF : Sensor information (See sensor information details.)
GG : Capstan motor speed
HH : Key code (JVC code)
I I : Supply reel winding diameter data, higher 8 bits.
JJ : Supply reel winding diameter data, lower 8 bits.
KK : Mechanism sensor information & mechanism mode position(See EMG detail of information <1>.)
LL : Tape speed data, higher 8 bits.
MM : Tape speed data, lower 8 bits.
NN : Cassette tape type <2>, higher 8 bits.
(See EMG detail of information <2>.)
OO : Cassette tape type <2>, lower 8 bits.
(See EMG detail of information <2>.)
PP : General data display area

YY: General data display area

***FF:Sensor information details**

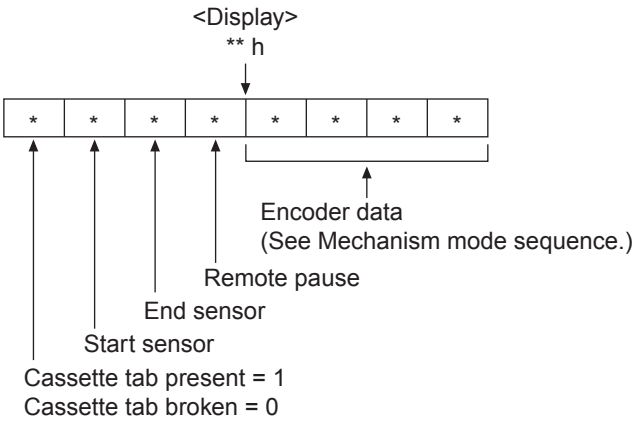


[For *HD only]

AA	BB	CC
DD	EE	FF
GGGG	HHHH	
I I	J J J J	
KKKK	L L L L	MMMM
ROM No.		

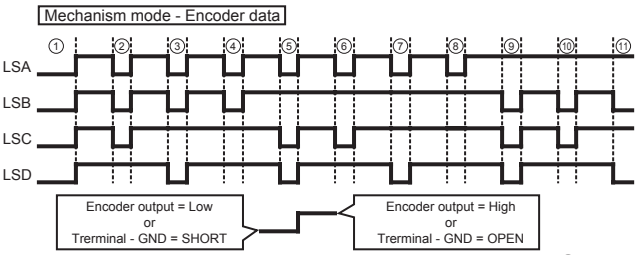
AA : Key code (JVC code)
BB : Deck operation mode(See EMG detail information <1>.)
CC : Mechanism operation mode (See EMG detail information <1>.)
DD : Sensor information (See sensor information details.)
EE : Capstan motor speed (Search, double speed)
FF : Tracking value
GGGG : Cassette tape type <2>, 16 bits. (See EMG detail information <2>.)
HHHH : Supply reel winding diameter data
I I : Capstan motor speed (FF/REW, double speed)
JJJJ : Tape speed data, lower 8 bits.
KKKK : General data display area
LLLL : General data display area
MMMM : General data display area

***DD:Sensor information details**

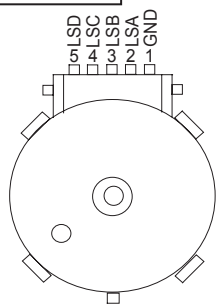


[For both MN*/HD*]

Mechanism mode sequence



No.	Position	Encoder data
①	EJECT	0 h = 0000
②	EJECT1	1 h = 0001
③	EJECT2	2 h = 0010
④	ULSTOP	3 h = 0011
⑤	UPPER	4 h = 0100
⑥	ONSTOP(PLAY)	5 h = 0101
⑦	FWD/SS	6 h = 0110
⑧	REV/SS	7 h = 0111
⑨	OFFSTOP	8 h = 1000
⑩	FFREW-BRAKE	9 h = 1001
⑪	FFREW	A h = 1010
⑫	MIDDLE	F h = 1111



2.3.5 EMG content description

Note:

EMG contents “E08/E09” are for the model with Dynamic Drum (DD).

FDP	CONTENT	CAUSE
E01: Loading EMG	If the mechanism mode does not change to the next mode within 4 seconds after the loading motor starts rotating in the loading direction, while the mechanism is in the after-loading position (with the tape up against the pole base), [E:01] is identified and the power is switched OFF. However, if the tape loading is not completed within 4 seconds after the loading motor starts rotating in the loading direction, the tape is simply unloaded and ejected. No EMG data is recorded in this case.	1. The mechanism is locked in the middle of the mode transition during a tape loading operation. 2. The mechanism overruns during the tape loading operation because the SYSCON cannot recognize the mechanism mode normally. This problem is due to a cause such as a rotary encoder failure. 3. Power is not supplied to the loading MDA. (M12V/Vcc/Vref/ICP are disconnected in the middle.)
E02: Unloading EMG	When the mechanism mode cannot be changed to another mode even when the loading motor has rotated for more than 4 seconds in the unloading direction, [E:02] is identified and the power is turned off.	1. The mechanism is locked in the middle of mode transition. 2. Without an eject signal being sent from the SYSCON, unloading is attempted (i.e. Ejection is attempted while the tape is still inside the mechanism.) because the SYSCON cannot recognize the mechanism mode normally. This is due to a cause such as a rotary encoder failure. (Mechanism position: UPPER) 3. Power is not supplied to the loading MDA. (M12V/Vcc/Vref/ICP are disconnected in the middle.)
E03: Take Up Reel Pulse EMG	When the falling edje of the take-up reel pulse has not been generated for more than 4 seconds in the capstan rotating mode, [E:03] is identified, the pinch rollers are turned off and stopped, and the power is turned off. In this case, however, the mechanism should be in position after tape loading. Note that the reel EMG is not detected during Slow/Frame advance operations.	1. The take-up reel pulse is not generated in the FWD transport modes (PLAY/FWD SEARCH/FF, etc.) because; 1)The idler gear is not meshed with the take-up reel gear because the mechanism malfunctions for some reason. 2)The idler gear is meshed with the take-up reel gear, but incapable of winding due to too large mechanical load (abnormal tension); 3)The reel is rotating normally but an FG pulse is not generated due to the take-up reel sensor failure. 2. The supply reel pulse is not generated in the REV transport modes (REV SEARCH/REW, etc.) because; 1) The idler gear is not meshed with the supply reel gear because the mechanism malfunctions for some reason. 2) The idler gear is meshed with the supply reel gear, but incapable of winding due to too large a mechanical load (abnormal tension); 3) The reel rotates normally but the FG pulse is not generated due to a supply reel sensor failure. 3. Power(SW5V) is not supplied to the reel sensor on the tape winding side.
E04: Drum FG EMG	When the drum FG pulse has not been input for more than 3 seconds in the drum rotating mode, [E:04] is identified, the pinch rollers are turned off and stopped, and the power is turned off.	1. The drum could not start or the drum rotation has stopped due to too large a load on the tape, because; 1) The tape tension is abnormally high; 2) The tape is damaged or a foreign object (grease, etc.) adheres to the tape. 2. The drum FG pulse did not reach the System controller CPU because; 1) The signal circuit is disconnected in the middle; 2) The FG pulse generator (hall device) of the drum is faulty. 3. The drum control voltage (DRUM CTL V) is not supplied to the MDA. 4. Power (M12V) is not supplied to the drum MDA.
E05: Cassette Eject EMG	If the cassette does not reach the eject position within about 0.7 seconds after the cassette housing has started the cassette ejection operation, [E:05] is identified, the drive direction is reversed to load the tape, the mode is switched to STOP mode with the pinch roller OFF, and the power is switched OFF. During the cassette insertion process, the drive direction is reversed and the cassette is ejected if the tape is not up against the pole base within about 3 seconds after the start of the cassette pulling-in operation. If the cassette does not reach the eject position within about 0.7 seconds after the drive mode reversal operation, [E:05] is identified and the power is switched OFF immediately.	1. The cassette cannot be ejected due to a failure in the drive mechanism of the housing. 2. When the housing load increases during ejection, the loading motor is stopped because of lack of headroom in its drive torque. Housing load increasing factors: Temperature environment (low temperature, etc.), mechanism wear or failure. 3. The sensor/switch for detecting the end of ejection are not functioning normally. 4. The loading motor drive voltage is lower than specified or power (M12V) is not supplied to the motor (MDA). 5. When the user attempted to eject a cassette, a foreign object (or perhaps the user's hand) was caught in the opening of the housing.
E06: Capstan FG EMG	When the capstan FG pulse has not been generated for more than 1 second in the capstan rotating mode, [E:06] is identified, the pinch rollers are turned off and stopped, and the power is turned off.However, the capstan EMG is not detected in SLOW/STILL modes. Note that, if the part number of the System Control IC begins with "MN" or "M3", the capstan EMG is not detected even during the FF/REW operation.	1. The capstan could not start or the capstan rotation has stopped due to too large a load on the tape, because; 1) The tape tension is abnormally high (mechanical lock); 2) The tape is damaged or a foreign object (grease, etc.) is adhered to the tape (occurrence of tape entangling, etc.). 2. The capstan FG pulse did not reach the System controller CPU because; 1) The signal circuit is disconnected in the middle; 2) The FG pulse generator (MR device) of the capstans is faulty. 3. The capstan control voltage (CAPSTAN CTL V) is not supplied to the MDA. 4. Power (M12V, SW5V) are not supplied to the capstan MDA.
E07: SW Power Short-Circuit EMG	When short-circuiting of the SW power supply with GND has lasted for 0.5 second or more, [E:07] is identified, all the motors are stopped and the power is turned off.	1. The SW 5 V power supply circuit is shorted with GND. 2. The SW 12 V power supply circuit is shorted with GND.
E08: DD Initialized (Absolute Position Sensor) EMG	When DD tilting does not complete in 4 seconds, [E:08] is identified, the tilt motor is stopped and the power is turned off.	1. The absolute value sensor is defective. (The soldered parts have separated.) 2. The pull-up resistor at the absolute sensor output is defective. (The soldered parts have separated.) 3. Contact failure or soldering failure of the pins of the connector (board-to-board) to the absolute value sensor. 4. The absolute value sensor data is not sent to the System Controller CPU.
E09: DD FG EMG	When the DD FG pulse is not generated within 2.5 seconds, [E:09] is identified, the tilt motor is stopped and the power is turned off.	1. The FG sensor is defective. (The soldered parts have separated.) 2. The pull-up resistor at the FG sensor output is defective. (The soldered parts have separated.) 3. Contact failure or soldering failure of the pins of the connector (board-to-board) to the FG sensor. 4. The power (5V) to the sensor is not supplied. (Connection failure/soldering failure) 5. The FG pulse is not sent to the System Controller CPU. 6. The tilt motor is defective. (The soldered parts have separated.) 7. The drive power to the tilt motor is not supplied. (Connection failure/soldering failure) 8. The tilt motor drive MDA - IC is defective. 9. Auto-recovery of the DD tilting cannot take place due to overrun.
E0A: Supply Reel Pulse EMG	When the falling edge of the supply reel pulse has not been generated for more than 10 seconds in the capstan rotating mode, [E:0A] is identified and the cassette is ejected (but the power is not turned off). In this case, however, the mechanism should be in the position after tape loading (with the tape up against the pole base). Also note that the reel EMG is not detected during Slow/Frame advance operations.	1. The supply reel pulse is not generated in the FWD transport mode (PLAY/FWD SEARCH/FF, etc.) because; 1) PLAY/FWD or SEARCH/FF is started while the tape in the inserted cassette is cut in the middle; 2) A mechanical factor caused tape slack inside and outside the supply reel side of the cassette shell. In this case, the supply reel will not rotate until the tape slack is removed by the FWD transport, so the pulse is not generated until then; 3) The reel is rotating normally but the FG pulse is not generated due to a supply reel sensor failure. 2. The take-up reel pulse is not generated in the REV transport mode (REV SEARCH/REW, etc.). 1) REV SEARCH/REW is started when the tape in the inserted cassette has been cut in the middle; 2) A mechanical factor caused tape slack inside and outside the take-up reel side of the cassette shell. In this case, the take up will not rotate until the tape slack is removed by the REV transport, so the pulse will not be generated until that time; 3) The reel is rotating normally but the FG pulse is not generated due to a take-up reel sensor failure. 3. The power (SW 5V) to a reel sensor is not supplied.
EU1: Head clog warning history	Presupposing the presence of the control pulse output in the PLAY mode, when the value obtained by mixing the two V.FM output channels (without regard to the A.FM output) has remained below a certain threshold level for more than 10 seconds, [E:U1] is identified and recorded in the emergency history. During the period in which the head clog is detected, the FDP shows "U:01" and the OSD repeats the "3 seconds of warning display" and the "7 seconds of noise picture display" alternately. EMG code : "E:C1" or "E:U1" / FDP : "U:01" / OSD : "Try cleaning tape." or "Use cleaning cassette." The head clog warning is reset when the above-mentioned threshold has been exceeded for more than 2 seconds or the mode is changed to another mode than PLAY.	

2.3.6 EMG detail information <1>

The status (electrical operation mode) of the VCR and the status (mechanism operation mode/sensor information) of the mechanism in the latest EMG can be confirmed based on the figure in EMG detail information <1> .

[FDP/OSD display] *1 : *2 : 34

*1 : Deck operation mode at the moment of EMG
*2 : Mechanism operation mode at the moment of EMG
3– : Mechanism sensor information at the moment of EMG
–4 : Mechanism mode position at the moment of EMG

Note:

- **For EMG detailed information <1>, the content of the code that is shown on the display (or OSD) differs depending on the parts number of the system control microprocessor (IC3001) of the VCR. The system control microprocessor parts number starts with two letters, refer these to the corresponding table.**

***1 : Deck operation mode**

[Common table of MN* and HD]

Display		Deck operation mode
MN*	HD*	
00	-	Mechanism being initialized
01	00	STOP with pinch roller pressure off (or tape present with P.OFF)
02	01	STOP with pinch roller pressure on
03	-	POWER OFF as a result of EMG
04	04	PLAY (Normal playback)
0C	0E	REC
10	11	Cassette ejected
20	22	FF
21	-	Tape fully loaded, START sensor ON, short FF
22	-	Cassette identification FWD SEARCH before transition to FF (SPx7-speed)
24	26	FWD SEARCH (variable speed) including x2-speed
2C	2E	INSERT REC
40	43	REW
42	-	Cassette identification REV SEARCH before transition to REW (SPx7-speed)
44	47	REV SEARCH (variable speed)
4C	4C	AUDIO DUB
6C	6E	INSERT REC (VIDEO + AUDIO)
84	84	FWD STILL / SLOW
85	85	REV STILL / SLOW
8C	8F	REC PAUSE
8D	-	Back spacing
8E	-	Forward spacing (FWD transport mode with BEST function)
AC	AF	INSERT REC PAUSE
AD	-	INSERT REC back spacing
CC	CD	AUDIO DUB PAUSE
CD	-	AUDIO DUB back spacing
EC	EF	INSERT REC (VIDEO + AUDIO) PAUSE
ED	-	INSERT REC (VIDEO + AUDIO) back spacing

***2 : Mechanism operation mode**

[Table of MN*]

Display	Mechanism operation mode
00	Command standby (No command to be executed)
01	Immediate Power OFF after EMG occurrence
02	Loading from an intermediate position during mechanism initialization
03	Unloading due to EMG occurrence during mechanism initialization
04	Ejecting cassette (ULSTOP to EJECT)
05	Inserting cassette (EJECT to ULSTOP)
06	Loading tape (ULSTOP to PLAY)
07	Unloading tape (PLAY to ULSTOP)
08	Transition from pinch roller ON to STOP
09	Transition from pinch roller OFF to STOP (PLAY to OFFSTOP)
0A	Transition from pinch roller OFF to STOP at power OFF
0B	Transition from pinch roller ON to STOP at power ON
0C	Transition to PLAY
0D	Transition to Search FF
0E	Transition to REC
0F	Transition to FWD STILL/SLOW
10	Transition to REV STILL/SLOW
11	Transition to Search REV
12	Transition from FF/REW to STOP
13	Transition to FF
14	Transition to REW
15	Tape end detection processing during loading
16	Short FWD/REV at tape sensor ON during unloading
17	Transition to FF/REW brake mode

[Table of HD*]

Display	Mechanism operation mode
00	STOP with pinch roller pressure off
01	STOP with pinch roller pressure on
02	U/L STOP (or tape being loaded)
04	PLAY (Normal playback)
05	PLAY (x1-speed playback using JOG)
0E	REC
11	Cassette ejected
22	FF
26	FWD SEARCH (variable speed) including x2-speed
2E	INSERT REC
43	REW
47	REV SEARCH
4C	AUDIO DUB
6E	INSERT REC (VIDEO + AUDIO)
84	FWD STILL/SLOW
85	REV STILL/SLOW
8F	REC PAUSE
AF	INSERT REC PAUSE
C7	REV SEARCH (x1-speed reverse playback using JOG)
CD	AUDIO DUB PAUSE
EF	INSERT REC (VIDEO + AUDIO) PAUSE
F0	Mechanism being initialized
F1	POWER OFF as a result of EMG
F2	Cassette being inserted
F3	Cassette being ejected
F4	Transition from STOP with pinch roller pressure on to STOP with pinch roller pressure off
F5	Transition from STOP with pinch roller pressure on to PLAY
F6	Transition from STOP with pinch roller pressure on to REC
F7	Cassette type detection SEARCH before FF/REW is being executed
F8	Tape being unloaded
F9	Transition from STOP with pinch roller pressure off to STOP with pinch roller pressure on
FA	Transition from STOP with pinch roller pressure off to FF/REW
FB	Transition from STOP with pinch roller pressure off to REC.P (T.REC,etc.)
FC	Transition from STOP with pinch roller pressure off to cassette type detection SEARCH
FD	Short REV being executed after END sensor on during unloading
FE	Tension loosening being executed after tape loading (STOP with pinch roller pressure on)
FF	Tape being unloaded

3- : Mechanism sensor information

[Common table of MN* and HD*]

Display	Mechanism sensor informatio n			
	REC safety SW	Start sensor	End sensor	Mechansim position sensor
0-	Tab broken	ON	ON	ON
1-	Tab broken	ON	ON	OFF
2-	Tab broken	ON	OFF	ON
3-	Tab broken	ON	OFF	OFF
4-	Tab present	OFF	ON	ON
5-	Tab present	OFF	ON	OFF
6-	Tab present	OFF	OFF	ON
7-	Tab present	OFF	OFF	OFF
8-	Tab broken	ON	ON	ON
9-	Tab broken	ON	ON	OFF
A-	Tab broken	ON	OFF	ON
B-	Tab broken	ON	OFF	OFF
C-	Tab present	OFF	ON	ON
D-	Tab present	OFF	ON	OFF
E-	Tab present	OFF	OFF	ON
F-	Tab present	OFF	OFF	OFF
	Tab broken = 0 Tab present = 1	Sensor ON = 0 sensor OFF = 1	Sensor ON = 0 Sensor OFF = 1	

-4 : Mechanism mode position

[Common table of MN* and HD*]

Mechanism sensor information	Dis-play	Deck operation mode	
Even number (0, 2, 4, 6, 8, A, C, E)	-0	Not established	
	-1	EJECT	EJECT position
	-2	EJECT-EJECT1	Intermodal position
	-3	EJECT1	EJECT1 position
	-4	EJECT1-EJECT2	Intermodal position
	-5	EJECT2	EJECT2 position
	-6	EJECT2-ULSTOP	Intermodal position
	-7	ULSTOP	ULSTOP position
	-8	ULSTOP-UPPER	Intermodal position
	-9	UPPER	Loading (unloading) tape
	-A	UPPER-ONSTOP	Intermodal position
	-B	ONSTOP	PLAY position
	-C	PLAY-FWD/SS	Intermodal position
	-D	FWD/SS	FWD (FWD Still/Slow) position
	-E	FWD/SS-REV	Intermodal position
	-F	REV	REV (REV Still/Slow) position
Odd number (1, 3, 5, 7, 9, B, D, F)	-0	REV-OFFSTOP	Intermodal position
	-1	OFFSTOP	Pinch roller OFF position
	-2	OFFSTOP-FFREWB	Intermodal position
	-3	FFREWB	FF/REW Brake position
	-4	FFREWB-FFREW	Intermodal position
	-5	FFREW	FF/REW position

2.3.7 EMG detail information <2>

The type of the cassette tape and the cassette tape winding position can be confirmed based on the figure in EMG detail information <2> .

Note:

- **EMG detail information <2> is the reference information stored using the remaining tape detection function of the cassette tape. As a result, it may not identify cassette correctly when a special cassette tape is used or when the tape has variable thickness.**

***5 : Cassette tape type <1>**

Display	Cassette tape type <1>
00	Cassette type not identified
16	Large reel/small reel (T-0 to T-15/T-130 to T-210) not classified
82	Small reel, thick tape (T-120) identified/thin tape (T-140) identified
84	Large reel (T-0 to T-60) identified
92	Small reel, thick tape (T-130) identified/thin tape (T-160 to T-210) identified
93	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) not classified
C3	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified
D3	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified
E1	C cassette, thick tape (TC-10 to TC-20) identified
E2	Small reel, thick tape (T-0 to T-100) identified
E9	C cassette, thin tape (TC-30 to TC-40) identified
F1	C cassette, thick tape/thin tape (TC-10 to TC-40) not classified

Notes:

- **Cassette tape type <1> is identified a few times during mode transition and the identification count is variable depending on the cassette tape type. If an EMG occurs in the middle of identification, the cassette tape type may not be able to be identified.**
- **If other value than those listed in the above table is displayed, the cassette tape type is not identified.**

***6 : Cassette tape winding position**

The cassette tape winding position at the moment of EMG is displayed by dividing the entire tape (from the beginning to the end) in 21 sections using a hex number from “00” to “14”.

“00” : End of winding
“14” : Beginning of winding
“FF” : Tape position not identified

***7 : Cassette tape type <2> (Winding area)**

Display	Cassette tape type <2>		(Reference) Word data (Beginning) (End)
00	Cassette type not identified		
04 - 08	C cassette, thick tape	TC-10	(0497 - 0506) (0732 - 0858)
05 - 06	Small reel, thick tape	T-20	(05A9 - 0661)
05 - 0C	C cassette, thick tape	TC-20P	(0599 - 05FF) (0AA1 - 0C07)
06 - 0C	C cassette, thin tape	TC-40	(0623 - 063D) (0C41 - 0CC3)
06 - 0C	C cassette, thin tape	TC-30	(0611 - 0638) (0C0C - 0CB2)
07 - 08	Small reel, thick tape	T-40	(07CC - 08E5)
09 - 0B	Small reel, thick tape	T-60	(09FD - 0B78)
0C - 0D	Small reel, thick tape	T-80(DF-160)	(0C20 - 0DFC)
0D - 0F	Small reel, thick tape	T-90(DF-180)	(0D31 - 0F3E)
0E - 10	Small reel, thick tape	T-100	(0E43 - 107F)
10 - 12	Small reel, thin tape	T-140	(10E1 - 120C)
10 - 13	Small reel, thick tape	T-120(DF-240)	(1073 - 1313)
11 - 14	Small reel, thick tape	T-130	(1185 - 1429)
12 - 14	Small reel, thin tape	T-160	(12D3 - 141F)
13 - 14	Small reel, thin tape	T-210(DF-420)	(1373 - 14C3)
13 - 14	Small reel, thin tape	T-180(DF-360)	(1357 - 14C0)
13 - 14	Small reel, thin tape	T-168	(1395 - 14EE)
13 - 14	Small reel, thick tape	DF-300	(13A8 - 14CE)
15 - 16	Large reel	T-20	(1536 - 1618)
16 - 17	Large reel	T-30	(1647 - 175A)
17 - 18	Large reel	T-40	(1759 - 189C)
19 - 1B	Large reel	T-60	(1989 - 1B2F)

Note:

- **The values of cassette tape type <2> in the above table are typical values with representative cassette tapes.**

2.3.8 EMG detail information <3>

Three deck operation modes preceding the deck operation mode in which the EMG occurs may be confirmed based on the figures in the EMG information detail <3>. For the contents of the displayed information, see the table "Deck operation mode" in section "2.3.6 EMG detail information <1>".

2.4 Service position

This unit has been designed so that the Mechanism and Main board assemblies can be removed together from the chassis assembly. Before diagnosing or servicing the circuit boards, take out the major parts from the chassis assembly.

2.4.1 How to set the “Service position”

(1) Refer to the disassembly procedure and perform the disassembly of the major parts before removing the Mechanism assembly.
(2) Remove the screws that fix the Mechanism assembly to the Chassis assembly. If any other screws are used to fix the boards, remove them also.
(3) Remove the combined Mechanism and Main board assemblies.
(4) If any other major parts are used, remove them also.
(5) Connect the wires and connectors of the major parts that have been removed in steps (1) to (4). (Refer to Fig. 2-4-1a.)
(6) Place the combined Mechanism, Main board and other board assemblies upside down.
(7) Insert the power cord plug into the power outlet and then proceed with the diagnostics and servicing of the board assembly.

Notes:

- **Before inserting the power cord plug into the power outlet, make sure that none of the electrical parts are able to short-circuit between the workbench and the board assembly.**
- **For the disassembly procedure of the major parts and details of the precautions to be taken, see “1.2 Removing the major parts”.**
- **If there are wire connections from the Main board and Mechanism assemblies to the other major parts, be sure to remove them (including wires connected to the major parts) first before performing step (2).**
- **When carrying out diagnosis and repair of the Main board assembly in the “Service position”, be sure to ground both the Main board and Mechanism assemblies. If they are improperly grounded, there may be noise on the playback picture or FDP counter display may move even when the mechanism is kept in an inoperative status.**
- **In order to diagnose the playback or recording of the cassette tape, set the Mechanism assembly to the required mode before placing it upside down. If the mechanism mode is changed (including ejection) while it is in an upside down position the tape inside may be damaged.**
- **For some models, the mechanism and board assemblies are attached by connectors only. When carrying out a diagnosis or repair of the boards in the “Service position”, make sure that the connectors are not disconnected.**

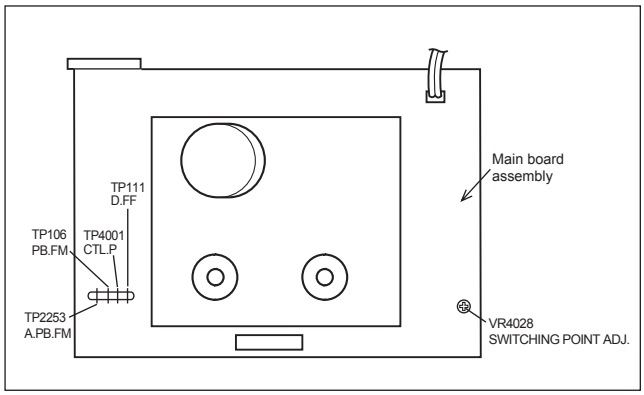


Fig.2-4-1a

2.5 Mechanism service mode

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the “Mechanism service mode”.

2.5.1 How to set the “Mechanism service mode”

(1) Set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received).
(2) Transmit the code “E5” from the Jig RCU.
(3) Release the lug of the Cassette holder and then slide the Cassette holder toward the direction where the Cassette holder is loaded by manually.
(4) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.
When the VCR is set to the Mechanism service mode, the symbols (“Timer”) in the FDP (LED) are blinked.

2.5.2 How to exit from the "Mechanism service mode"

(1) Unplug the power cord plug from the power outlet.

2.6 Maintenance and inspection

2.6.1 Cleaning

out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

Note:

- **Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.**

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.

(3) After cleaning, make sure that the cleaned parts are completely dry before using the cassette tape.

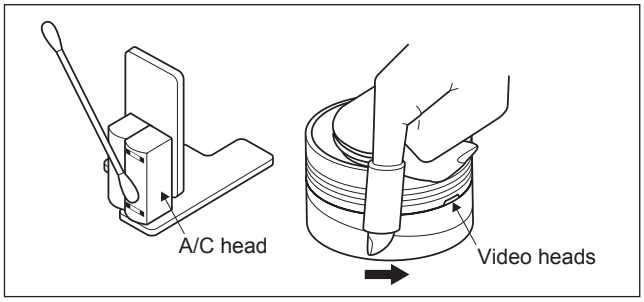


Fig.2-7-1a

2.6.2 Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

Note:

- **See the "mechanism assembly" diagram of the "parts list" for the lubricating or greasing spots, and for the types of oil or grease to be used.**

2.6.3 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time, even if the set is not used.

System	Parts name	Operation hours	
		1000H	2000H
Tape transport	Drum assembly	C,X	X
	A/C head	C,X	C,X
	Pinch roller arm assembly	C	C
	Full erase head	C	C
	Tension arm assembly	C	C
	Capstan motor (Shaft)	C	C
	Guide arm assembly	C	C
Drive	Capstan motor		X
	Capstan brake assembly		X
	Main brake assembly		X
	Belt (Capstan)	X	X
	Loading motor		X
	Clutch unit		X
	Worm gear		X
	Control plate		X
Other	Rotary encoder		X

C : Cleaning
X : Inspection or Replacement if necessary

For disassembling and assembling of MECHANISM ASSEMBLY, refer to the SERVICE MANUAL No.86700 (MECHANISM ASSEMBLY).

SECTION 3
ADJUSTMENT

3.1 Before adjustment

3.1.1 Precaution

- **The adjustments of this unit include the mechanism compatibility and electrical adjustments. During the performance of this work, be sure to observe the precautions for each type of adjustment.**
- **If there is a reference to a signal input method in the signal column of the adjustment chart, "Ext. S-input" means the Y/C separated video signal and "Ext. input" means the composite video signal input.**
- **Unless otherwise specified, all measuring points and adjustment parts are located on the Main board.**

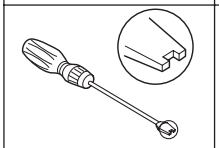
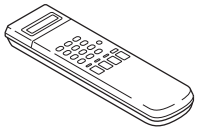
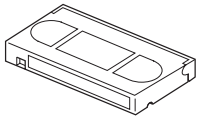
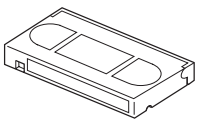
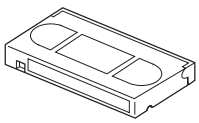
3.1.2 Required test equipments

- Color (colour) television or monitor
- Oscilloscope: wide-band, dual-trace, triggered delayed sweep
- Signal generator: RF / IF sweep / marker
- Signal generator: stairstep, color (colour) bar [NTSC]
- Recording tape
- Digit-key remote controller(provided)

3.1.3 Required adjustment tools

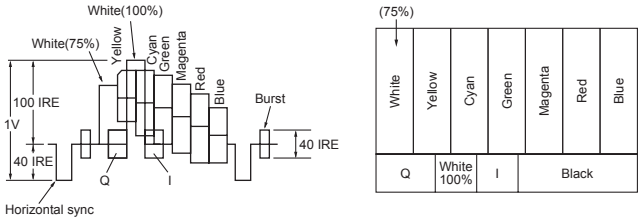
○ : Used --- : Not used

	Mechanism compatibility adjustment	Electrical adjustment
Roller driver	○	---
Jig RCU	---	---
Back tension cassette gauge	○	---
Alignment tape(MHP)	○	---
Alignment tape(MHP-L)	○	○

Roller driver PTU94002	Jig RCU PTU94023B	Back tension cassette gauge PUJ48076-2
		
Alignment tape (SP, stairstep, NTSC) MHP	Alignment tape (EP, stairstep, NTSC) MHP-L	
		

3.1.4 Color (colour) bar signal,Color (colour) bar pattern

• Color(colour) bar signal [NTSC] **• Color(colour) bar pattern [NTSC]**



3.1.5 Switch settings

When adjusting this unit, set the VCR mode and switches as described below.

- When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). (See "section 2 DISASSEMBLY".)

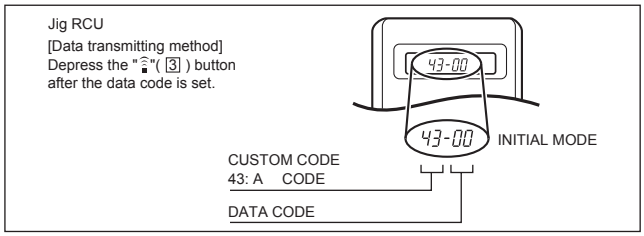


Fig.3-1-5a Jig RCU [PTU94023B]

- Set the switches as shown below unless otherwise specified on the relevant adjustment chart. The switches that are not listed below can be set as desired.
  If the VCR is not equipped with the functions detailed below, setup is not required.

AUTO PICTURE/VIDEO CALIBRATION/ B.E.S.T./D.S.P.C.	OFF
PICTURE CONTROL/SMART PICTURE	NORMAL/NATURAL
VIDEO STABILIZER	OFF
TBC	ON
Digital 3R	ON
VIDEO NAVIGATION/TAPE MANAGER	OFF
BLUE BACK	OFF

3.1.6 Manual tracking mode (Auto tracking ON/OFF) setting

(1) In order to set to the manual tracking mode during tape playback, press the "SP/EP(LP)"button on the remote control unit.
  - Each press of the button switches the auto tracking ON or OFF.
  - When the manual tracking mode is set, the tracking is placed at the center position.

(2) Press "channel +/-" to adjust the tracking manually.

3.2 Mechanism compatibility adjustment

Notes:

- **Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the A/C head, drum assembly or any part of the tape transport system.**
- **To prevent damaging the alignment tape in the compatibility adjustment, prepare a cassette tape (for self-recording/playback), perform a test on it by transporting it and making sure that the tape is not bent by the tape transport mechanisms such as in the guide rollers.(See Fig.3-2-2a.)**

3.2.1 Tension pole position

Notes:

- **This adjustment must be performed every time the tension band is replaced.**

Signal	(A)	• Back tension cassette gauge [PUJ48076-2]
Mode	(B1) (B2)	• PB • Eject end
Adjustment part	(F)	• Adjust pin [Mechansim assembly]
Specified value	(G)	• 25 - 51 gf•cm (2.45 - 5 x 10^{-3} Nm)

(1) Play back the back tension cassette gauge (A).
(2) Check that the indicated value on the left side gauge is within the specified value (G).
(3) If the indicated value is not within the specified value (G), perform the adjustment in a following procedure.(See Fig.3-2-1a.)
   a) Remove the top frame, cassette holder and side frames (L/R) all together. (Refer to the SERVICE MANUAL No.86700 [MECHANISM ASSEMBLY].)
   b) Rotate the loading motor gear to move the control plate so that the triangular stamping to the left of the “P”stamping is aligned with the stamping (a) on the main deck. This positioning is mode (B1).
   c) Adjust by turning the adjustment pin so that the tip of the tension arm is aligned with the stamping (b) on the main deck.
   d) Rotate the reel disk (S) by about one turn clockwise and make sure that the round hole of the adjustment pin is located in the “OK” range. If it is outside this range, restart the adjustment from the beginning.

   After completion of the adjustment, rotate the loading gear motor to return it to the mode (B2) position.

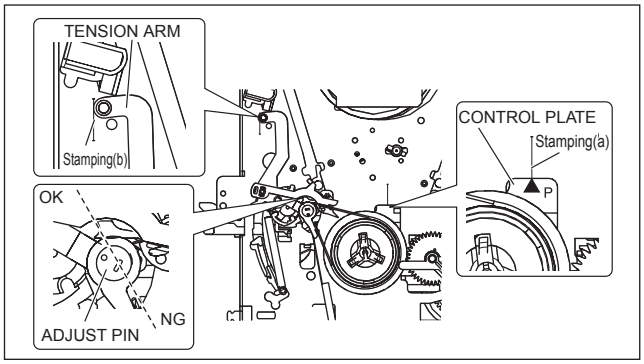


Fig.3-2-1a

3.2.2 FM waveform linearity

Signal	(A1) (A2)	• Alignment tape(SP, stairstep, NTSC) [MHP] • Alignment tape(EP,stairstep,NTSC) [MHP-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• Guide roller [Mechanism assembly]
Specified value	(G)	• Flat V.PB FM waveform
Adjustment tool	(H)	• Roller driver [PTU94002]

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Set the VCR to the manual tracking mode.
(4) Make sure that there is no significant level drop of the V.PB FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig. 3-2-2b.)
(5) Reduce the V.PB FM waveform by the tracking operation. If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver to make the V.PB FM waveform linear.
   If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the roller driver to make it linear. (See Fig. 3-2-2b.)
(6) Make sure that the V.PB FM waveform varies in parallel and linearly with the tracking operation again. When required,
   perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
(7) Unload the cassette tape once, play back the alignment tape (A1) again and confirm the V.PB FM waveform.
(8) After adjustment, confirm that the tape wrinkling does not occur at the roller upper or lower limits. (See Fig. 3-2-2a.) [Perform adjustment step (9) only for the models equipped with SP mode and EP (or LP) mode.]

   [Perform adjustment step (9) only for the models equipped with SP mode and EP (or LP) mode.]
(9) Repeat steps (1) to (8) by using the alignment tape (A2).

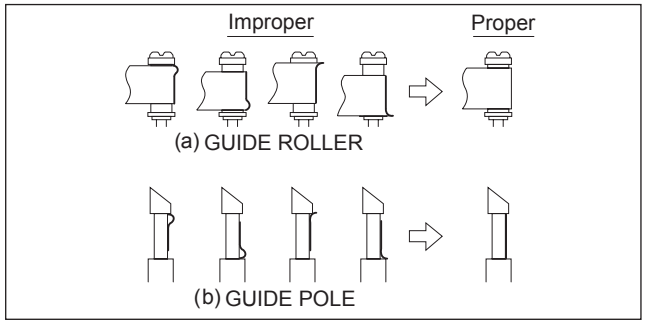


Fig.3-2-2a

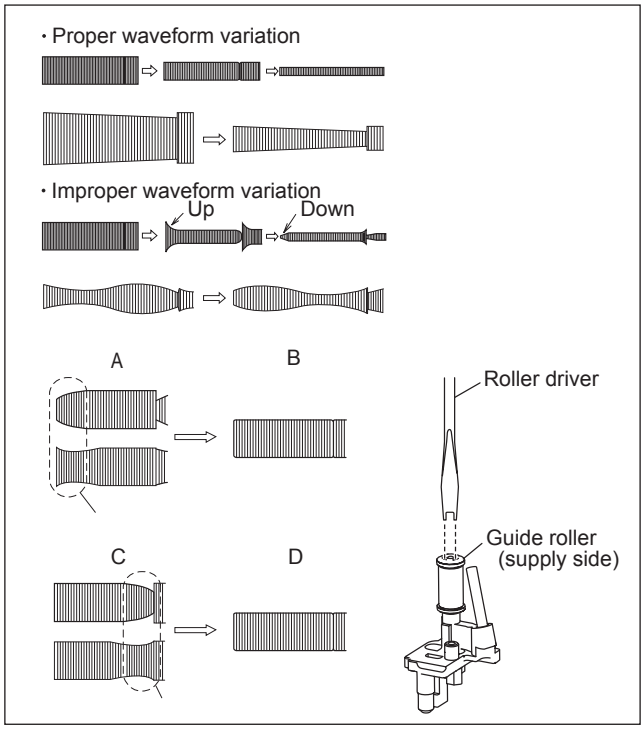


Fig.3-2-2b

3.2.3 Height and tilt of the A/C head

Note:

- **Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (Refer to the SERVICE MANUAL No.86700 [MECHANISM ASSEMBLY].)**

Signal	(A)	• Alignment tape(SP, stairstep, NTSC) [MHP]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D1) (D2)	• AUDIO OUT terminal • TP4001 (CTL. P)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• A/C head [Mechanism assembly]
Specified value	(G)	• Maximum waveform

(1) Play back the alignment tape (A).
(2) Apply the external trigger signal to D.FF (E), to observe the AUDIO OUT waveform and Control pulse waveform at the measuring points (D1) and (D2) in the ALT mode.
(3) Set the VCR to the manual tracking mode.
(4) Adjust the AUDIO OUT waveform and Control pulse waveform by turning the screws (1), (2) and (3) little by little until both waveforms reach maximum. The screw (1) and (3) are for adjustment of tilt and the screw (2) for azimuth.

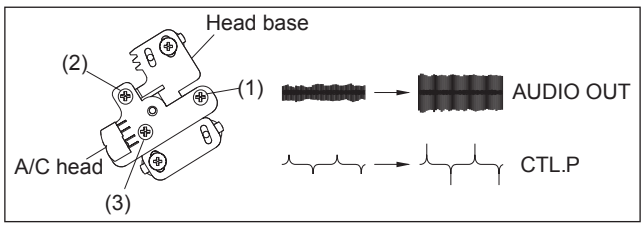


Fig.3-2-3a

3.2.4 A/C head phase (X-value)

Signal	(A1) (A2)	• Alignment tape(SP, stairstep, NTSC) [MHP] • Alignment tape(EP,stairstep,NTSC) [MHP-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• A/C head base [Mechanism assembly]
Specified value	(G)	• Flat V.PB FM waveform
Adjustment tool	(H)	• Roller driver [PTU94002]

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Set the VCR to the manual tracking mode.
(4) Loosen the screws (4) and (5), then set the Roller driver to the innermost projected part of the A/C head. (See Fig. 3-2-4a.)
(5) Rotate the roller driver so that the A/C head comes closest to the capstan. From there, move the A/C head back gradually toward the drum until the point where the FM waveform is maximized for the second time, and then tighten the screws (4) and (5) temporarily.
(6) Play an alignment tape (A2) and set to the manual-tracking mode.
(7) Fine-adjust A/C head base position to maximize the FM waveform, and then tighten the screws (4) and (5) firmly.
(8) Play alignment tapes (A1) and (A2) and confirm that the FM waveforms are maximized when the tracking is at the center position.

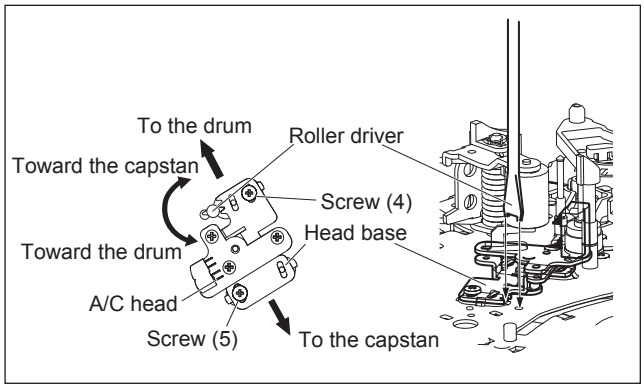


Fig.3-2-4a

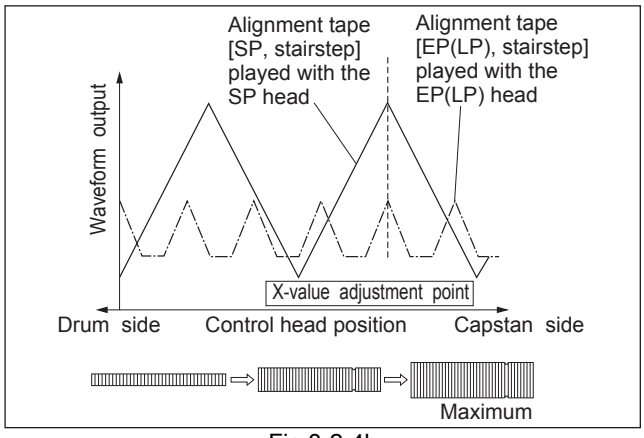


Fig.3-2-4b

3.3 Electrical adjustment

Note:

The following adjustment procedures are not only necessary after replacement of consumable mechanical parts or board assemblies, but are also provided as references to be referred to when servicing the electrical circuitry.

In case of trouble with the electrical circuitry, always begin a service by identifying the defective points by using the measuring instruments as described in the following electrical adjustment procedures. After this, proceed to the repair, replacement and/or adjustment. If the required measuring instruments are not available in the field, do not change the adjustment parts (variable resistor, etc.) carelessly.

3.3.1 Servo circuit

3.3.1.1 Switching point

Signal	(A1) (A2)	• Stairstep signal • Alignment tape(EP,stairstep,NTSC) [MHP-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D1) (D2)	• VIDEO OUT terminal (75 ohm terminated) • TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• R4028
Specified value	(G)	• 6.5 ± 0.5H

(1) Play back the signal (A1) of the alignment tape (A2).
(2) Apply the external trigger signal to D.FF (E) to observe the VIDEO OUT waveform and V.PB FM waveform at the measuring points (D1) and (D2).
(3) Set the VCR to the manual tracking mode.
(4) Adjust tracking so that the V.PB FM waveform becomes maximum.
(5) Adjust the adjustment point (F) so that the value of the switching point becomes identical to the adjustment value (G).

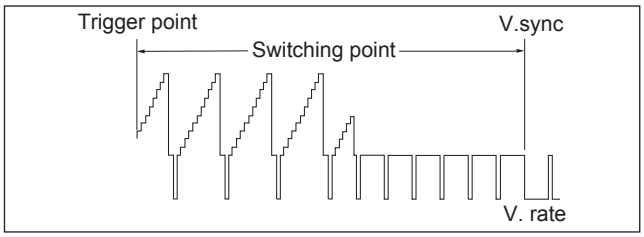


Fig.3-3-1a Switching point

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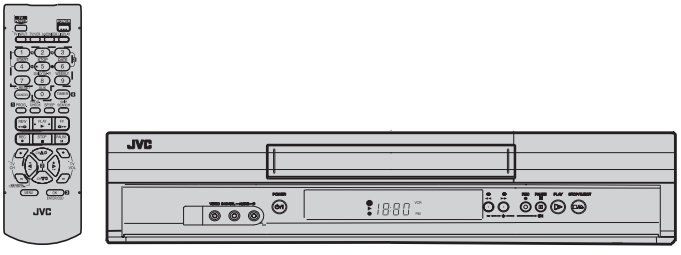

VHS Hi-Fi SQPB

For disassembling and assembling of MECHANISM ASSEMBLY, refer to the SERVICE MANUAL No.86700 (MECHANISM ASSEMBLY).

SPECIFICATION

GENERAL

Power requirement	:	AC 120 V ~, 60 Hz
Power consumption		
Power on	:	13 W
Power off	:	1.5 W
Temperature		
Operating	:	5°C to 40°C (41°F to 104°F)
Storage	:	-20°C to 60°C (-4°F to 140°F)
Operating position	:	Horizontal only
Dimensions (W x H x D)	:	435 mm x 94 mm x 248 mm (17-3/16" x3-3/4"x9-3/4")
Weight	:	2.7 kg (5.9 lbs)
Format	:	VHS NTSC standard
Maximum recording time		
SP	:	210 min. with ST-210 video cassette
EP	:	630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	:	NTSC-type color signal and EIA mono-chrome signal, 525 lines/60 fields
Recording/Playback system	:	DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	:	45 dB
Horizontal resolution	:	230 lines
Frequency range		
Normal audio	:	70 Hz to 10,000 Hz
Hi-Fi audio	:	20 Hz to 20,000 Hz
Input/Output	:	RCA connectors (IN x 1, OUT x 1)

TUNER

Tuning system	:	Frequency-synthesized tuner
Channel coverage		
VHF	:	Channels 2-13
UHF	:	Channels 14-69
CATV	:	113Channels
RF output	:	Channel 3, 4 or - (off) (preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference	:	Quartz
Program capacity	:	1-year programmable timer/8 programs

ACCESSORIES

Provided accessories	:	RF cable (F-type) Infrared remote control unit Lithium battery -CR2032

Specifications shown are for SP mode unless specified otherwise. E. & O.E. Design and specifications subject to change without notice.

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No.82952SCH
2003/01

CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions

The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

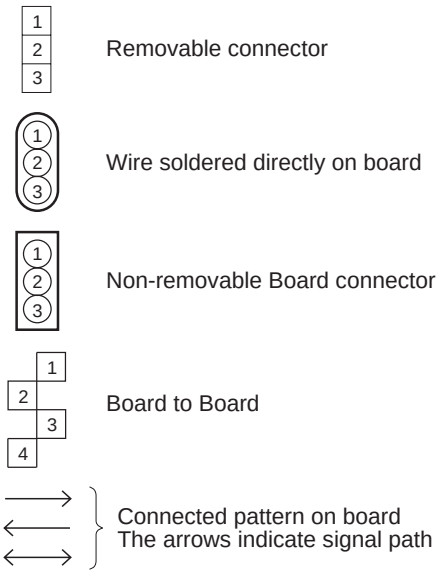
1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 Ω.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values are in μH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

2. Indications of control voltage

AUX : Active at high

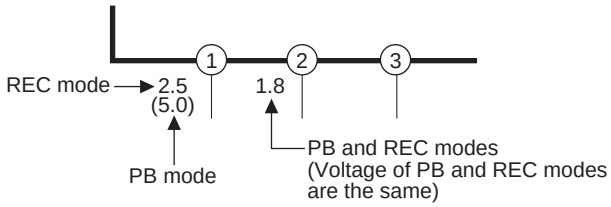
$\overline{\text{AUX}}$ or AUX(L) : Active at low

3. Interpreting Connector indications



4. Voltage measurement

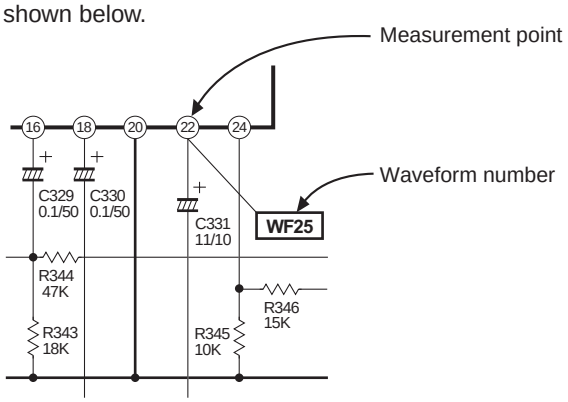
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   – : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, -8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.



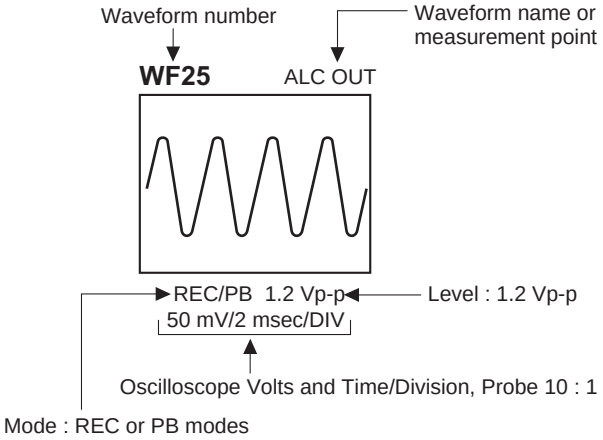
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, -8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.

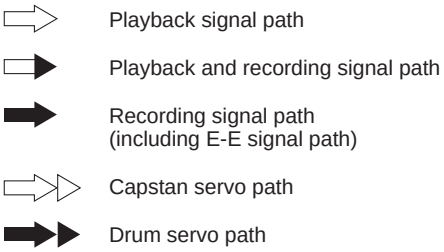


5) Waveform indications

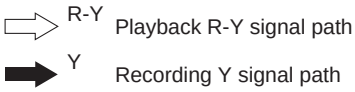


6. Signal path Symbols

The arrows indicate the signal path as follows.

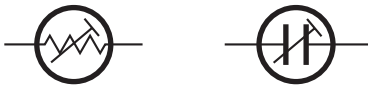


(Example)



7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.

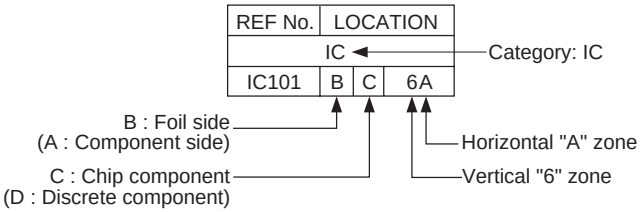
CIRCUIT BOARD NOTES

1. Foil and Component sides

1) Foil side (B side) :
   Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
   Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

Parts location are indicated by guide scale on the circuit board.



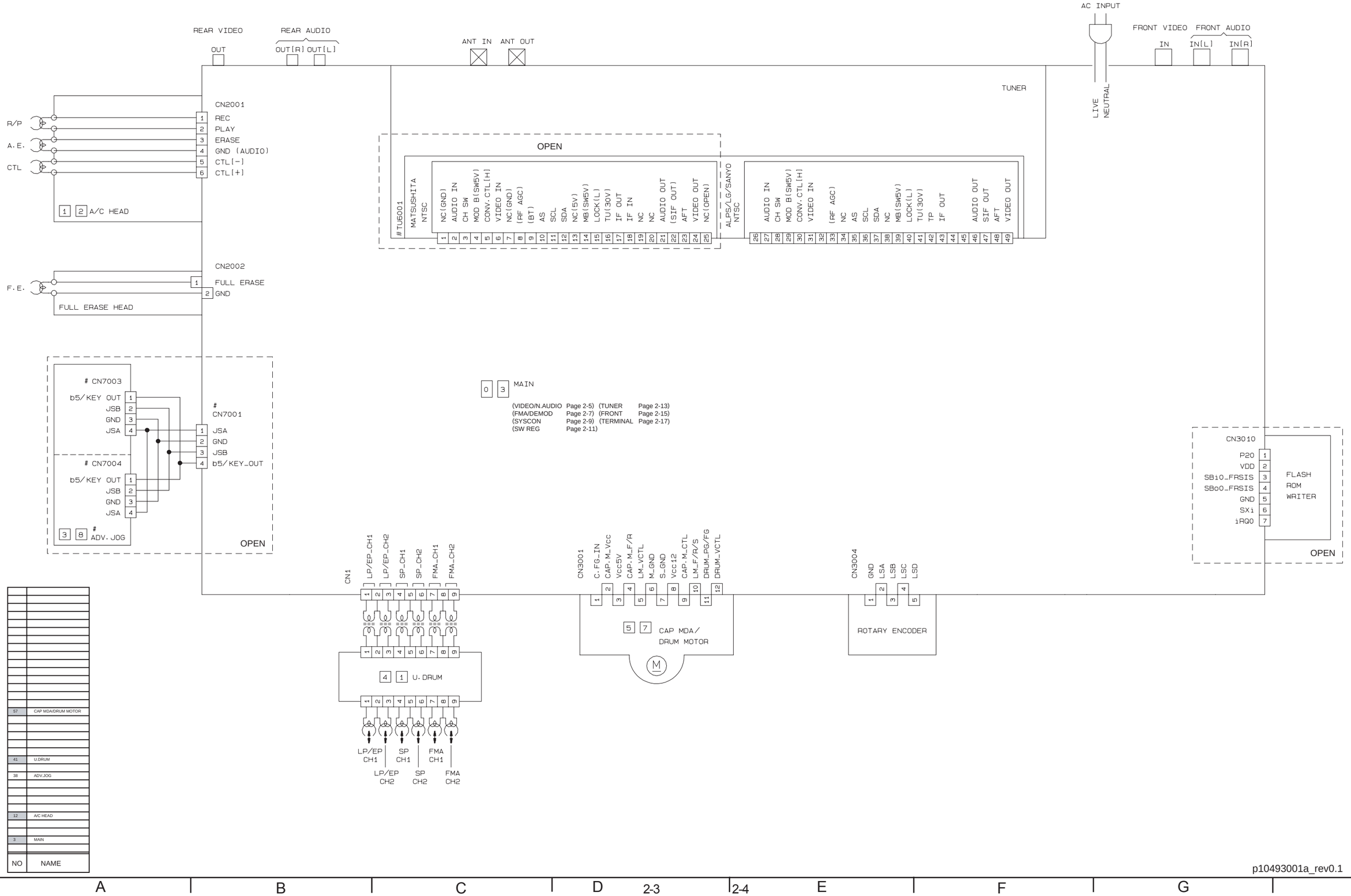
Note:

For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

S40884-03

■ BOARD INTERCONNECTIONS

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



p10493001a_rev0.1

■ MAIN (VIDEO/N. AUDIO) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.

03 MAIN(VIDEO/N. AUDIO)

TO FMA/DEMOD
Fsc
NA_PB
NA_REC
RF_AUDIO
F.AUDIO[R]
F.AUDIO[L]
LINE_OUT[R]
LINE_OUT[L]
GND

TO TERMINAL
LINE_OUT[L]
LINE_OUT[R]
F.AUDIO[L]
F.AUDIO[R]
GND
FRONT_V_IN
GND

TO TUNER
RF_AUDIO
GND
TU_VIDEO

TO SYSCON
V_TO_OSD
GND

TO SW.REG
SW5V
SW12V
GND

TO FMA/DEMOD
FMA_CH1
FMA_COM
FMA_CH2

TO DRUM
CN1
FMA_CH2
FMA_CH1
SP_CH2
SP_CH1
LP/EP_CH2
LP/EP_CH1

TO SYSCON
CTL[+]
CTL[-]

TO A/C HEAD
CN2001
REC
PLAY
ERASE
GND(AUDIO)
CTL[-]
CTL[+]

CN2002
FE

D1
D2 OPEN

L2001 SHORT
C2003 47/6.3
C2004 OPEN
R2007 12k
R2010 12k
R2003 100
C2002 1/50
C2001 .7 50
C40 10/16
C2014 OPEN
INPUT_SEL
C39 0.01
C38 47/6.3
L5 10
C144 0.001
R118 2.2K
C37 47/6.3
R9 OPEN
R8 OPEN
X2 QAX0575-001 QAX0576-001 QAX0577-001
C36 4.7/25
C35 0.033
C120 1/50
C34 0.1
C32 0.01
R7 820
C33 2.2 /50
C31 47/6.3
R6 27k
C30 0.47 /50
L11 12
C29 4700p
C28 3.3 /50
C27 0.022
C25 56
C26 0.01
B2 OPEN
B1 SHORT
L4 10
R76 6.8K
TO SYSCON
D.FF
VIDEO_ENV
N.REC_ST[H]
N.REC[H]
I2C_DATA_A/V
I2C_CLK_A/V
A.MUTE[H]
V.PULSE
SB_GAIN
AGC_CTL

R78 OPEN
C1 0.1
C2 0.1
L1 10
C6 0.01
C3 0.1
C4 0.1
C5 47/6.3
C7 4.7/6.3
C8 0.1
R77 10k
TP111 D.FF

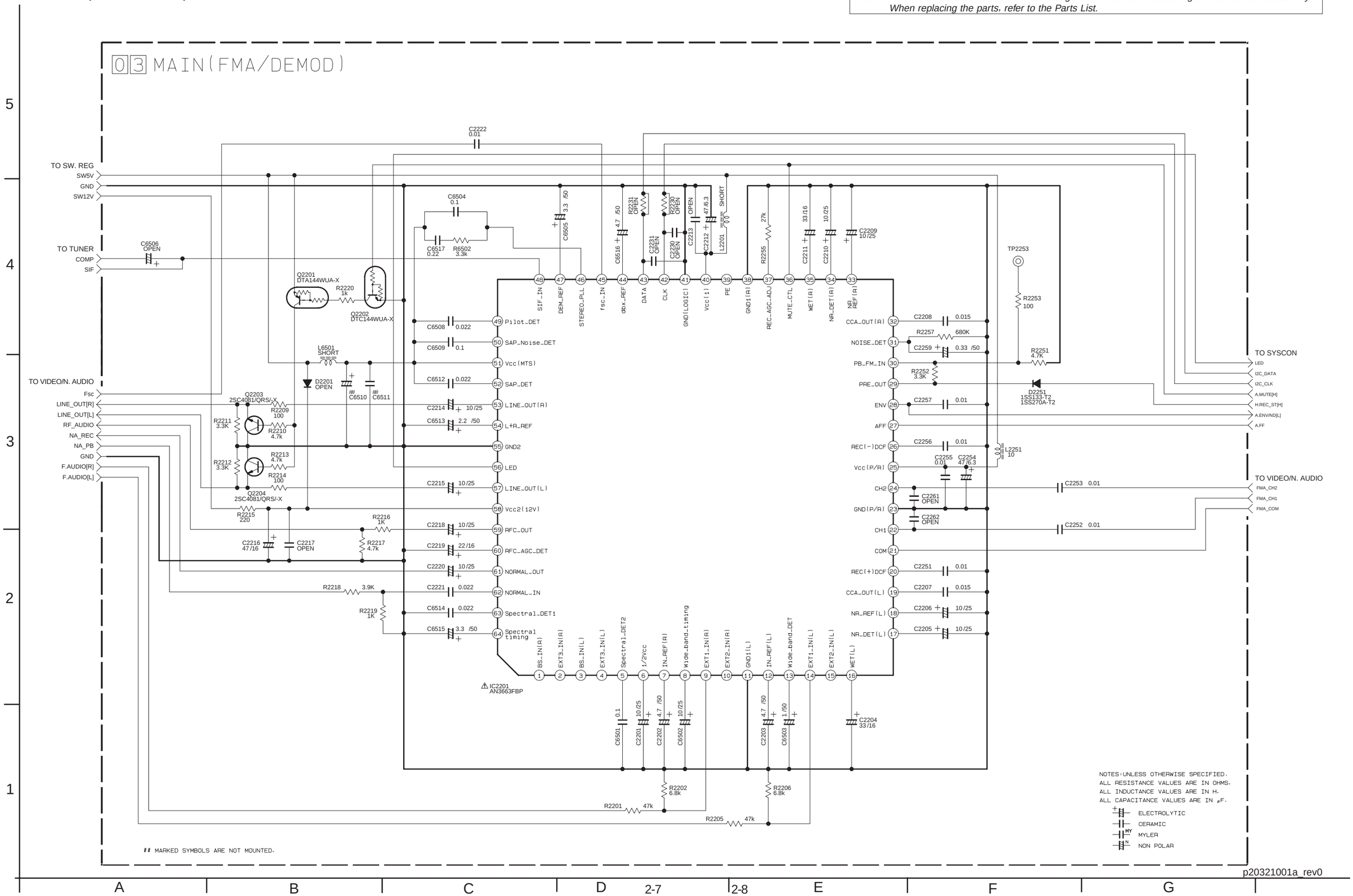
C2005 4.7/50
R2014 2.0k
R2015 2.0k
R2013 6.8k
C2007 2.2/10
C2006 0.012
C2009 0.001
C2008 4.7/50
C2010 0.0015
C2011 4.7/50
C2016 47k
R2017 15k
R2057 47k
R2058 18k
R2059 47k
R2060 18k
Q2052 2SA1576A/QR/-X 2SB1218A/R/-X 2PA1576R/R-X
Q2053 DTC114WUA/-X DTC114WUA/-X RN1305-X
Q2054 2SA1576A/QR/-X 2SB1218A/QR/-X 2PA1576R/R-X
Q2055 DTC114WUA/-X DTC114WUA/-X RN1309-X
Q2003 DTA114WUA/-X DTA114WUA/-X RN2309-X
R2018 4.7K
R2019 4.7K
Q2001 2SC4081/QRS/-X 2SC4081R/-X 2PC4081/R/-X
Q2002 2SC4081/QRS/-X 2SC1815A/QRS/-X 2PC4081/R/-X
T2051 PET0922 PET0923 QQR0002-001
C2051 330p
R2053 4.7K
C2052 0.082
C2053 0.0047
R2054 12k
R2056 82
C2055 1025
C2054 0.022
R2055 3.3
TP106 PB FM
IC1 JCP8041-NVA
C2012 47/50
R1 6.8k
C10 150p
C11 0.1
C12 33p
C14 0.1
C16 0.1
C17 4.7 /50
C9 0.01
C18 47 /50
C21 0.1
C23 4.7 /6.3
C24 0.1
C22 0.01
C2 0.1
R2 1.5k
R3 6.8k
R104 6.8K
R93 1K
Q38 2SC4081/QRS/-X 2PC4081R/-X
C15 1
R99 470
R49 470
Q22 2SC4081/QRS/-X 2PC4081R/-X
C22 OPEN
R86 OPEN
L3 10
C51 1/50

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.
ELECTROLYTIC
CERAMIC
MYLER
NON POLAR

p10486001a_rev0

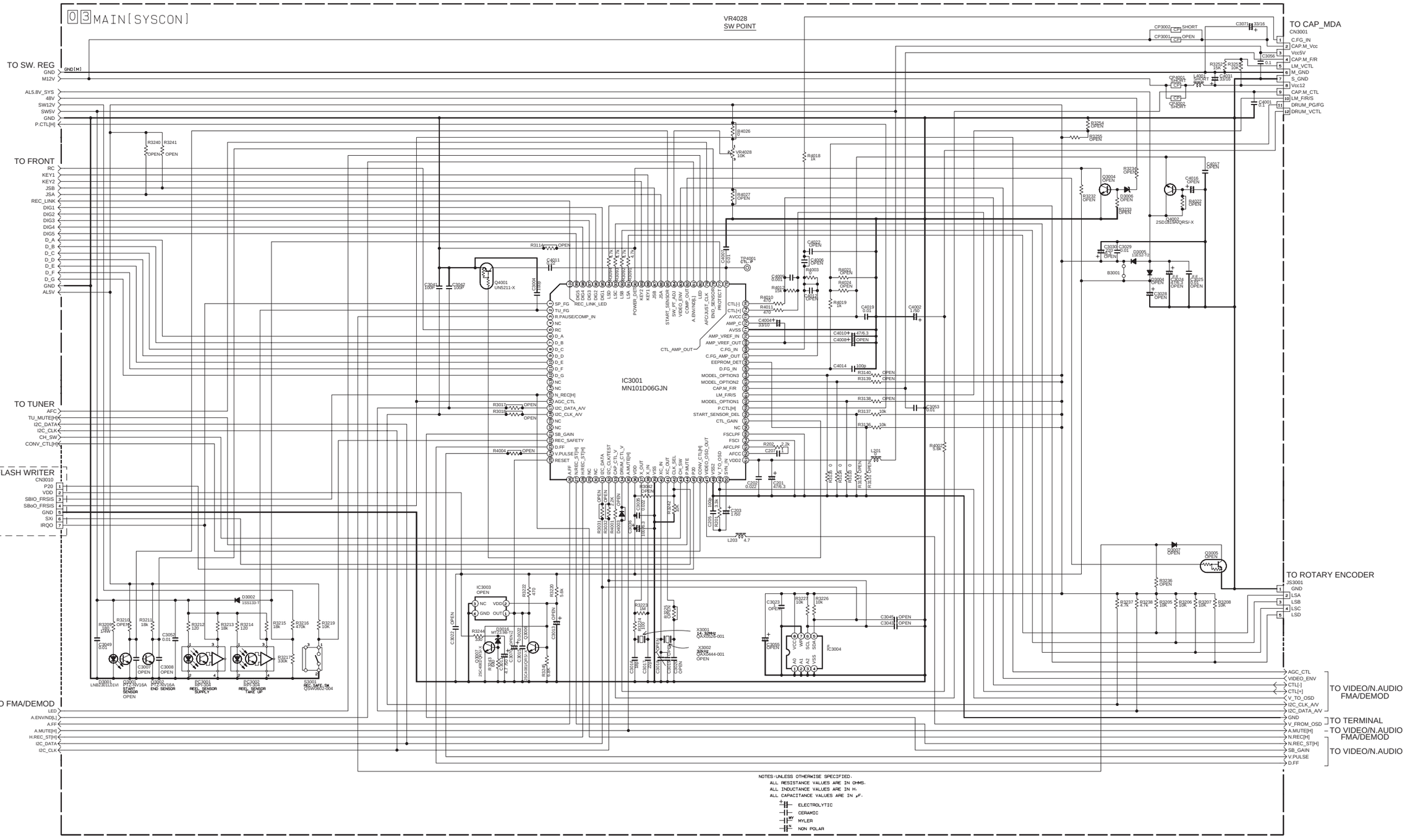
■ MAIN (FMA/DEMOD) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



■ MAIN (SYSCON) SCHEMATIC DIAGRAM

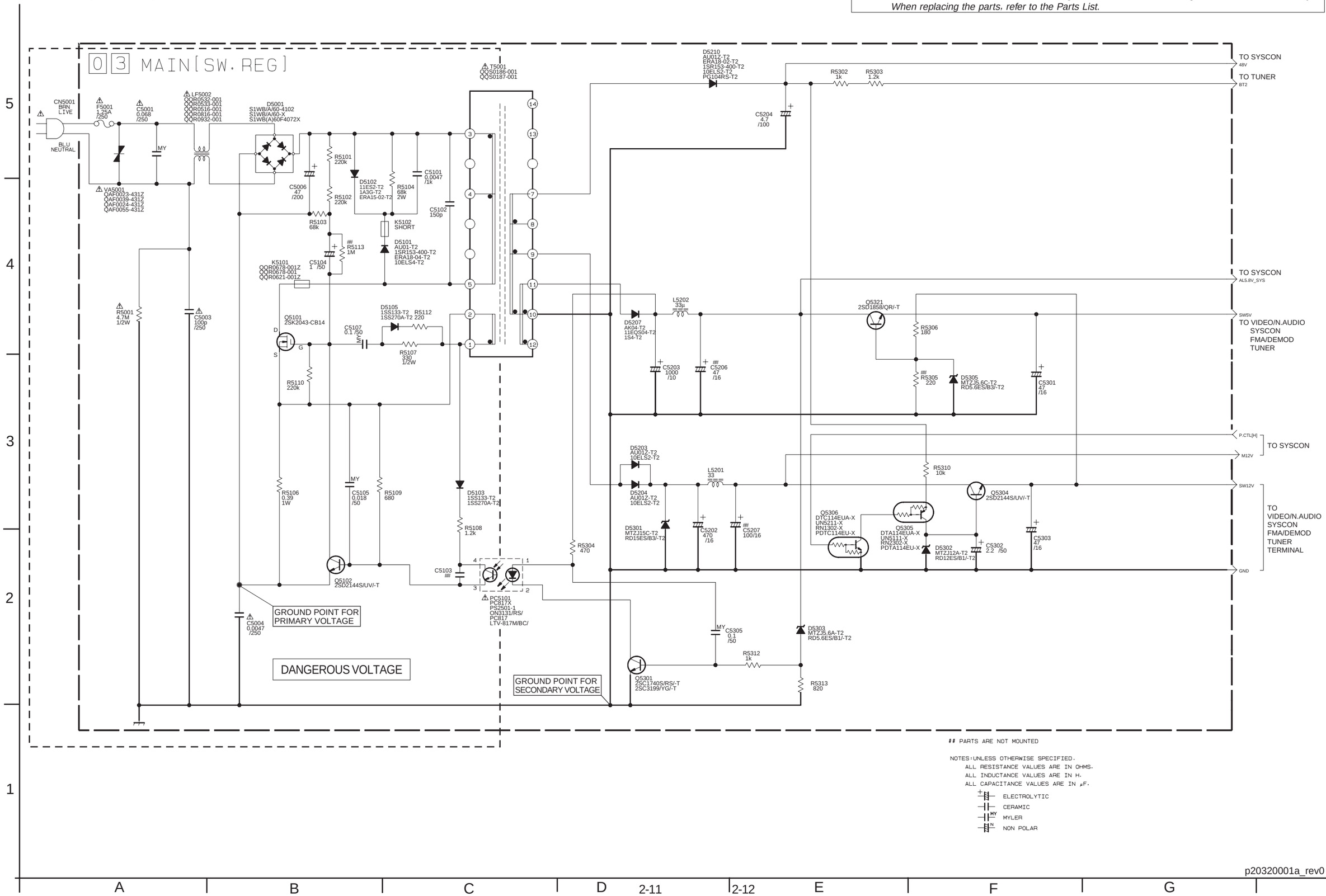
Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



p10485001a rev0.1

■ MAIN (SW.REG) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



PARTS ARE NOT MOUNTED

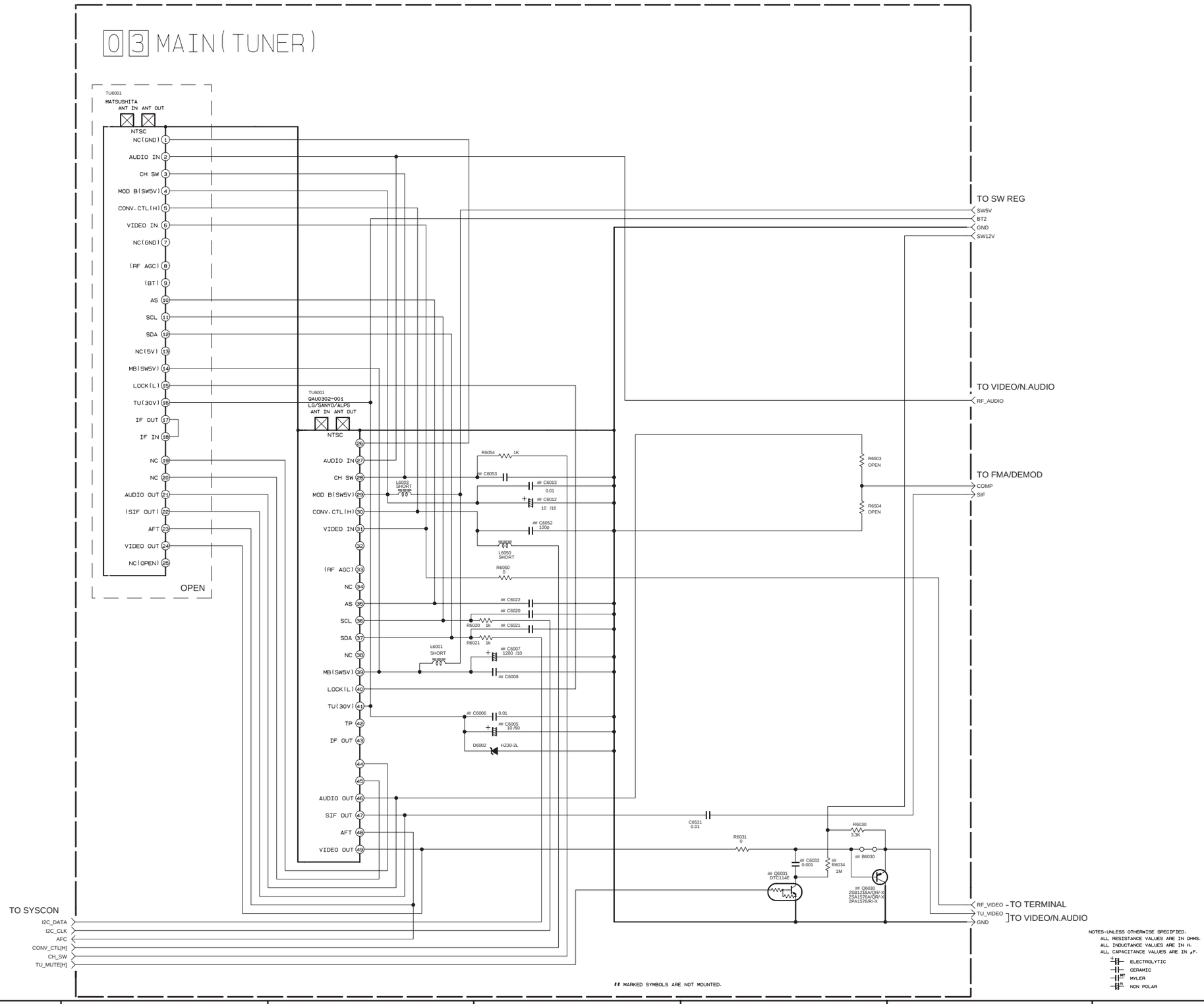
NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN µF.

ELECTROLYTIC
CERAMIC
MY MYLER
N NON POLAR

p20320001a_rev0

■ MAIN (TUNER) SCHEMATIC DIAGRAM

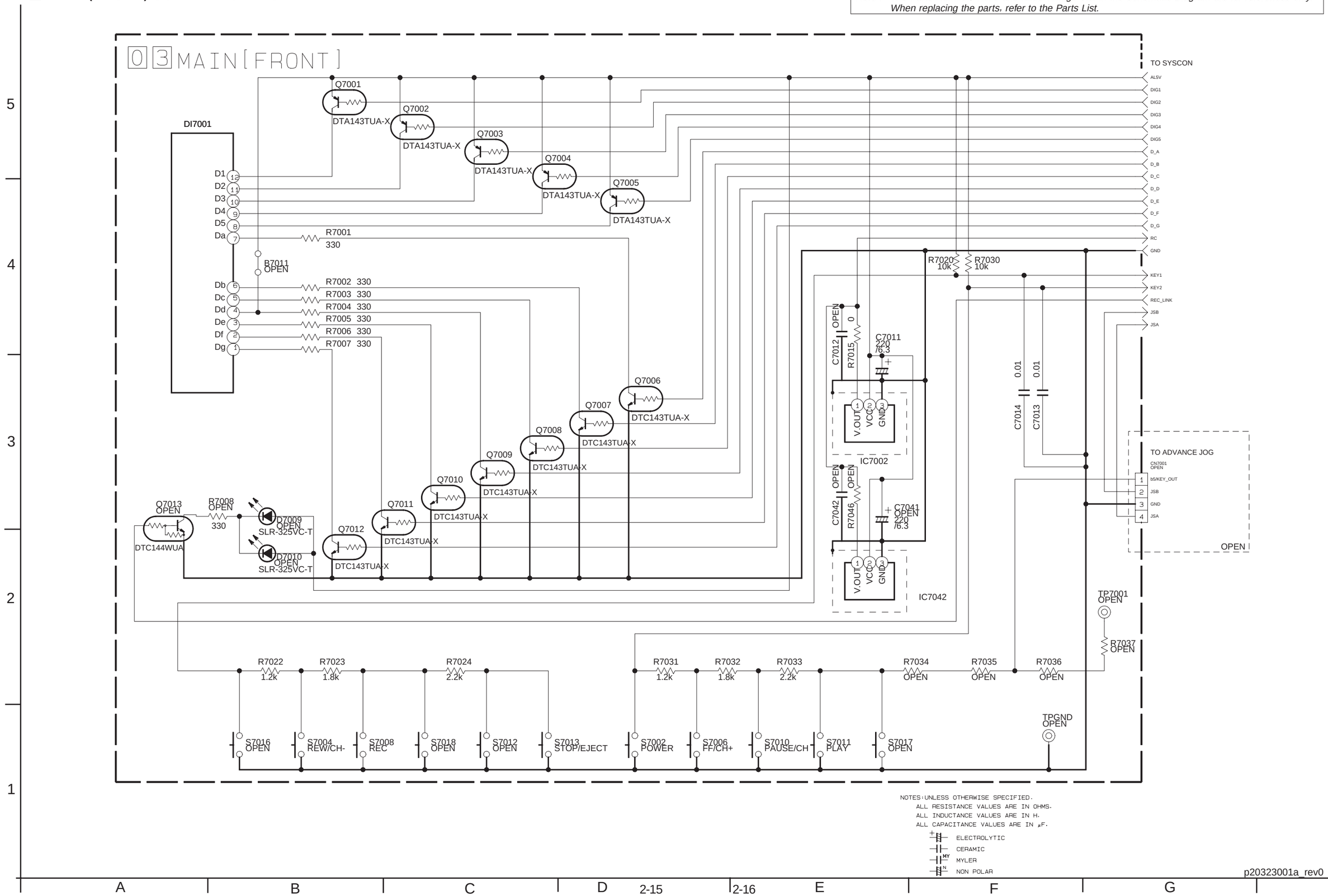
Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



p10487001a_rev0

■ MAIN (FRONT) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



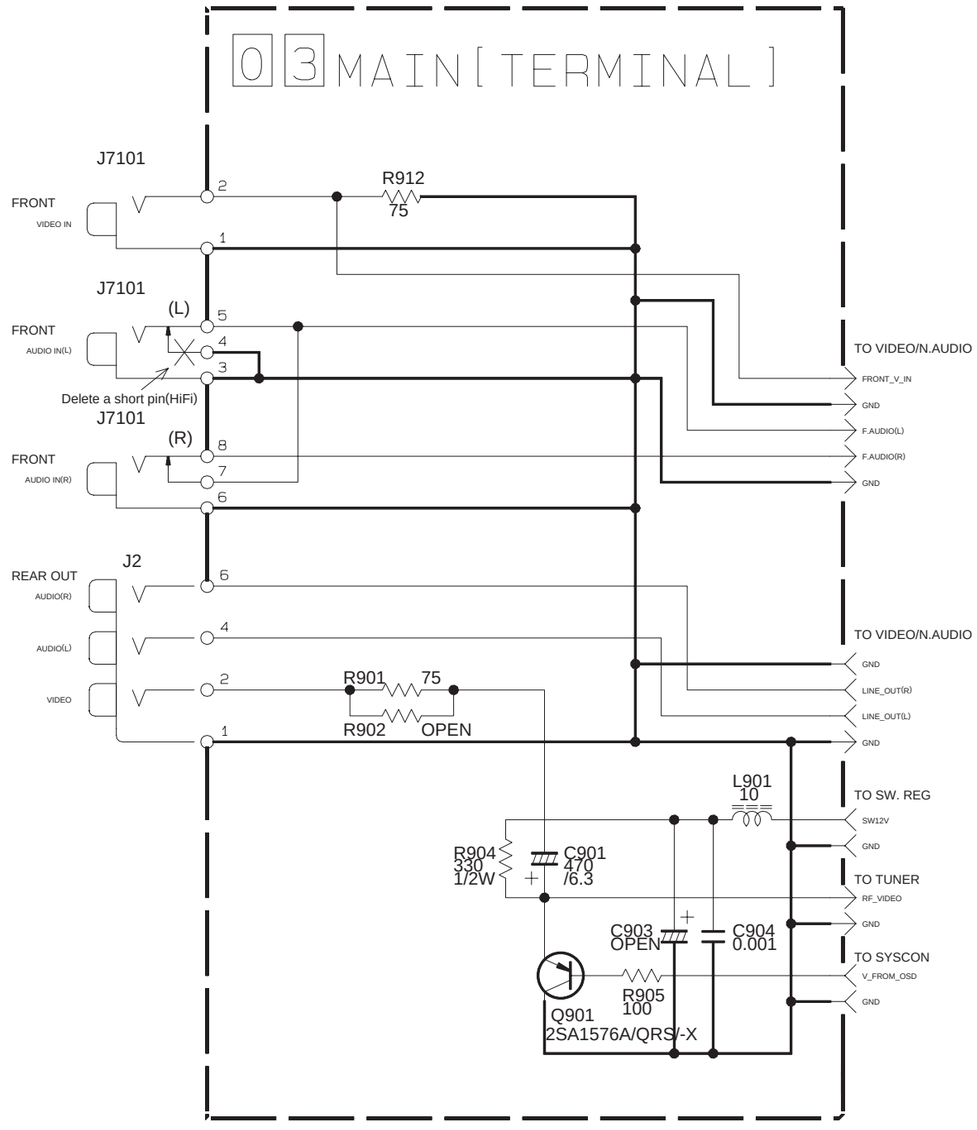
NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

+ ELECTROLYTIC
CERAMIC
MY MYLER
N NON POLAR

p20323001a_rev0

■ MAIN (TERMINAL) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



NOTES: UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

+ ELECTROLYTIC
CERAMIC
MY MYLER
N NON POLAR

p40042001a_rev0

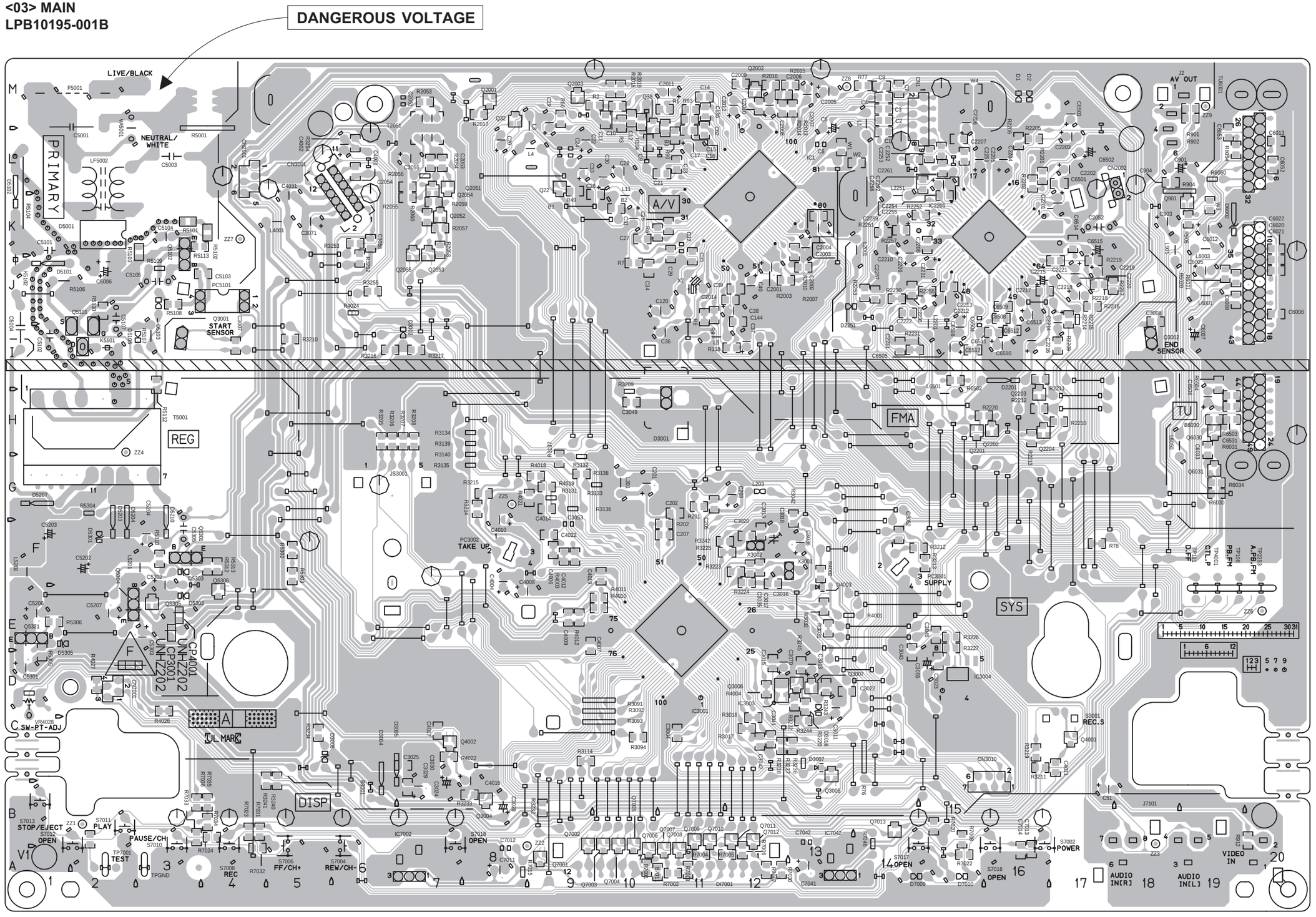
■ COMPONENT PARTS LOCATION GUIDE <MAIN> LPB10195-001B

REF.NO.	LOCATION
CAPACITOR	
C1	B C 14L
C2	B C 14M
C3	B C 14M
C4	B C 14M
C5	A D 13M
C6	A D 13L
C7	B C 14M
C8	B C 14M
C9	B C 10L
C10	B C 10M
C11	B C 10M
C12	B C 10M
C14	B C 11M
C15	B C 11M
C16	B C 11L
C17	A D 11L
C19	A D 9M
C20	A D 8L
C21	B C 11L
C22	A D 9L
C23	B C 11L
C24	A D 9L
C25	B C 11K
C26	B C 10K
C27	B C 10K
C28	A D 10L
C29	B C 11K
C30	A D 10L
C31	A D 10K
C32	A D 11K
C33	A D 9L
C34	B C 10J
C35	B C 11K
C36	A D 11I
C37	A D 12I
C38	A D 12J
C39	B C 12J
C40	A D 12J
C51	A D 17B
C62	B C 11L
C120	A D 10J
C136	B C 11M
C144	B C 12J
C201	A D 10G
C202	B C 11G
C203	A D 12G
C205	B C 11G
C207	B C 11F
C901	A D 19L
C903	A D 18K
C904	B C 18L
C2001	A D 12J
C2002	A D 13K
C2003	A D 13K
C2004	B C 13K
C2005	A D 13M
C2006	B C 12M
C2007	A D 13M
C2008	A D 12M
C2009	B C 12M
C2010	B C 12M
C2011	A D 11M
C2012	A D 12M
C2014	B C 12J
C2051	A D 7M
C2052	A D 17K
C2053	B C 7L
C2054	B C 7L
C2055	A D 7L
C2201	A D 17K
C2202	A D 17L
C2203	A D 17L
C2204	A D 16L
C2205	A D 15L
C2206	A D 15M
C2207	B C 15L
C2208	B C 15K
C2209	A D 14K
C2210	A D 14K
C2211	A D 15J
C2212	A D 15J
C2213	B C 15J
C2214	A D 17J
C2215	A D 16J
C2216	A D 16I
C2217	B C 16J
C2218	A D 17J
C2219	A D 17J
C2220	A D 17J
C2221	B C 17J
C2222	B C 14J
C2230	B C 14J
C2231	B C 14I
C2251	B C 15L
C2252	B C 15L
C2253	B C 15L
C2254	A D 15L
C2255	B C 15K
C2256	B C 15L
C2257	B C 14J
C2259	A D 14K
C2261	B C 14L
C2262	B C 15L
C3004	B C 11C
C3007	B C 4I
C3008	B C 18J
C3011	A D 13D
C3013	A D 13D
C3015	B C 12D
C3016	B C 12F
C3017	B C 12F
C3018	A D 12F
C3019	B C 12F
C3020	B C 12F
C3022	B C 13D
C3023	B C 15D
C3024	A D 7C
C3025	B C 7C
C3028	A D 8B
C3029	B C 7B
C3030	A D 7B
C3035	B C 12F
C3036	A D 13F
C3041	B C 12C
C3042	B C 12C
C3043	B C 14D
C3045	B C 15E
C3049	B C 10H
C3052	B C 14F
C3053	A D 9F
C3055	A D 15D
C3056	B C 6K
C3070	A D 12D
C3071	A D 5K
C4001	B C 6L
C4002	A D 6L
C4004	A D 8E
C4006	B C 9F
C4007	B C 9E
C4008	A D 8E
C4009	B C 9E
C4010	A D 8G
C4011	B C 17C
C4012	B C 9F
C4014	B C 9G
C4016	A D 8C
C4017	B C 7C
C4019	B C 10F
C4022	B C 9F
C4031	A D 5K
C5001	A D 1M
C5003	A D 3L
C5004	A D 1J
C5006	A D 2J
C5101	A D 1K
C5102	A D 1I
C5103	B C 4J
C5104	A D 3K
C5105	A D 3J
C5107	A D 2I
C5202	A D 2F
C5203	A D 1F
C5204	A D 3F
C5206	A D 1E
C5207	A D 2E
C5301	A D 1D
C5302	A D 3F
C5303	A D 3E
C5305	A D 3G
C6005	A D 19J
C6006	B C 20J
C6007	A D 19J
C6008	B C 19J
C6012	A D 19K
C6013	B C 20L
C6020	B C 20J
C6021	B C 20J
C6022	B C 20K
C6033	B C 19H
C6052	B C 20L
C6053	B C 19L
C6501	B C 17L
C6502	A D 17L
C6503	A D 17M
C6504	A D 15I
C6505	A D 15I
C6506	A D 19H
C6508	B C 16J
C6509	B C 16J
C6510	A D 16I
C6511	B C 16I
C6512	B C 16I
C6513	A D 16J
C6514	B C 17K
C6515	A D 17K
C6516	A D 15J
C6517	B C 15I
C6531	B C 19H
C7011	A D 8A
C7012	A D 8A
C7013	B C 16A
C7014	B C 16A
C7041	A D 13A
C7042	A D 13B
CONNECTOR	
CN1	A D 15M
CN2001	A D 4L
CN2002	A D 17L
CN3001	A D 6L
CN3010	A D 16B
CN7001	A D 2D
DIODE	
D1	A D 16M
D2	A D 16M
D2201	A D 15I
D2251	A D 13J
D3001	A D 11H
D3002	A D 7I
D3004	A D 6C
D3005	A D 7C
D3006	A D 5C
D3007	B C 13C
D3016	A D 13D
D4003	B C 13E
D5001	B C 2K
D5101	A D 1J
D5102	A D 1L
D5103	A D 3J
D5105	A D 3I
D5203	A D 2G
D5204	A D 2G
D5207	A D 1G
D5210	A D 3G
D5301	A D 2F
D5302	A D 3E
D5303	A D 3F
D5305	A D 2E
D6002	A D 19K
D7009	A D 14A
D7010	A D 15A
DI7001	A D 11A
FUSE	
F5001	A D 2M
IC	
IC1	B C 12K
IC2201	B C 16K
IC3001	B C 11E
IC3003	B C 12D
IC3004	B C 15D
IC7002	A D 7A
IC7042	A D 13A
COIL	
L1	A D 14L
L3	A D 9M
L4	A D 9L
L5	A D 12I
L11	A D 10K
L201	A D 10G
L203	A D 12G
L901	A D 18K
L2001	A D 14J
L2201	A D 15J
L2251	A D 14K
L4001	A D 5K
L5201	A D 3F
L5202	A D 1F
L6001	A D 19J
L6003	A D 19K
L6050	A D 19H
L6501	A D 15H
TRANSISTOR	
Q22	B C 9L
Q32	B C 8M
Q38	B C 10M
Q901	B C 19K
Q2001	B C 8M
Q2002	B C 12M
Q2003	B C 9M
Q2051	B C 7L
Q2052	B C 7K
Q2053	B C 7K
Q2054	B C 7L
Q2055	B C 7K
Q2201	B C 15H
Q2202	B C 16H
Q2203	B C 16H
Q2204	B C 16H
Q3001	A D 3I
Q3002	A D 18I
Q3004	B C 8B
Q3005	B C 13C
Q3006	B C 13D
Q3007	B C 13D
Q4001	B C 17C
Q4002	B C 7C
Q5101	A D 2I
Q5102	A D 3K
Q5301	A D 3F
Q5304	A D 2E
Q5305	B C 3E
Q5306	B C 4E
Q5321	A D 1E
Q6030	B C 19H
Q6031	B C 19G
Q7001	B C 9A
Q7002	B C 9B
Q7003	B C 10B
Q7004	B C 10B
Q7005	B C 10B
Q7006	B C 10A
Q7007	B C 11A
Q7008	B C 11A
Q7009	B C 11B
Q7010	B C 11B
Q7011	B C 12B
Q7012	B C 12B
Q7013	B C 14B
RESISTER	
R1	B C 11M
R2	B C 10M
R3	B C 10M
R6	B C 11K
R7	B C 10J
R8	B C 11J
R9	B C 11J
R49	B C 9L
R66	B C 9M
R76	A D 14C
R77	B C 14M
R78	B C 17F
R90	B C 11L
R93	B C 11M
R104	B C 10M
R118	B C 12I
R201	B C 11G
R202	B C 11F
R901	B C 19M
R902	B C 19M
R904	A D 18L
R905	B C 19K
R912	B C 20B
R2003	B C 12J
R2007	B C 13J
R2010	B C 13K
R2013	B C 13M
R2014	B C 12M
R2015	B C 13M
R2016	B C 12M
R2017	B C 8M
R2018	B C 10M
R2019	B C 10M
R2053	B C 7M
R2054	B C 7L
R2055	B C 7K
R2056	A D 7L
R2057	B C 7K
R2058	B C 7K
R2059	B C 7K
R2060	B C 7K
R2201	B C 16L
R2202	B C 16L
R2205	B C 16L
R2206	B C 16L
R2209	B C 17I
R2210	B C 17H
R2211	B C 16I
R2212	B C 16H
R2213	B C 16H
R2214	B C 17J
R2215	A D 17I
R2216	B C 17J
R2217	B C 17J
R2218	B C 17J
R2219	B C 17J
R2220	B C 16H
R2230	B C 14J
R2231	B C 14I
R2251	B C 14K
R2252	B C 15K
R2253	B C 14J
R2255	B C 15J
R2257	B C 14K
R3017	B C 12C
R3018	B C 12C
R3031	B C 13E
R3032	B C 13E
R3042	B C 13G
R3091	A D 10D
R3092	A D 10D
R3093	A D 10C
R3094	B C 10C
R3114	B C 9C
R3131	A D 9G
R3132	A D 10G
R3133	A D 10G
R3134	A D 8H
R3135	A D 8G
R3136	A D 9G
R3137	B C 9G
R3138	B C 9G
R3139	A D 8H
R3140	A D 8H
R3205	B C 6H
R3206	B C 6H
R3207	B C 7H
R3208	B C 7H
R3209	A D 10H
R3210	B C 5I
R3211	B C 16C
R3212	B C 15F
R3213	B C 15F
R3214	B C 8G
R3215	B C 8G
R3216	B C 6I
R3217	B C 7I
R3219	B C 16C
R3220	B C 13D
R3222	B C 13D
R3223	B C 12F
R3224	B C 12F
R3225	B C 15E
R3226	B C 15E
R3227	B C 15E
R3232	B C 9B
R3233	B C 8B
R3234	B C 5C
R3236	A D 13C
R3237	B C 13C
R3238	B C 12C
R3240	B C 5C
R3241	B C 5C
R3242	B C 12F
R3243	B C 13D
R3244	B C 13C
R3245	B C 13D
R3252	B C 6K
R3253	B C 6K
R3254	B C 6L
R3255	B C 6J
R4001	A D 14E
R4002	B C 13F
R4003	B C 9F
R4004	B C 12D
R4010	B C 10E
R4011	B C 10E
R4012	B C 9E
R4018	B C 9G
R4019	B C 9G
R4021	B C 9G
R4022	B C 7C
R4024	A D 6J
R4026	B C 3D
R4027	B C 2D
R5001	A D 4M
R5101	B C 3K
R5102	B C 4K
R5103	B C 3K
R5104	A D 1L
R5105	A D 1J
R5106	A D 1J
R5107	A D 3I
R5108	B C 3J
R5109	A D 3J
R5110	B C 2J
R5112	B C 3I
R5113	B C 3K
R5302	B C 5F
R5303	B C 5F
R5304	A D 2G
R5305	B C 1D
R5306	B C 1E
R5310	B C 3F
R5312	B C 4F
R5313	B C 4F
R6020	B C 19J
R6021	B C 19J
R6030	B C 19G
R6031	B C 19H
R6034	B C 19G
R6050	A D 19L
R6054	B C 19L
R6502	B C 15I
R6503	B C 19H
R6504	B C 19I
R7001	B C 10A
R7002	B C 11A
R7003	B C 11A
R7004	B C 11A
R7005	B C 12A
R7006	B C 12A
R7007	B C 12A
R7008	B C 15B
R7015	A D 8A
R7020	B C 15B
R7022	B C 15A
R7023	B C 4B
R7024	B C 4B
R7030	B C 12A
R7031	B C 4B
R7032	B C 4A
R7033	B C 3B
R7034	B C 4B
R7035	B C 4B
R7036	B C 3B
R7037	B C 2B
R7046	A D 14A
SWITCH	
S3001	A D 17C
S7002	A D 16B
S7004	A D 6B
S7006	A D 5B
S7008	A D 4B
S7010	A D 3B
S7011	A D 2B
S7012	A D 2B
S7013	A D 1B
S7016	A D 16B
S7017	A D 15B
S7018	A D 7B
TEST POINT	
TP106	A D 19F
TP111	A D 19F
TP2253	A D 20F
TP4001	A D 19F
TP7001	A D 2A
TPGND	A D 3A
OTHERS	
CP3001	B C 3E
CP3002	A D 3E
CP4001	B C 3E
CP4002	A D 3E
FC5001	A D 2M
FC5002	A D 1M
J2	A D 19M
J7101	A D 19A
JS3001	A D 6G
K5101	A D 2I
K5102	A D 1K
LF5002	A D 2L
PC0324	A D 11J
PC3001	A D 14F
PC3002	A D 8F
PC5101	A D 4J
T2051	A D 7L
T5001	A D 1H
TU6001	A D 20M
VA5001	A D 2M
VR4028	A D 1D
X2	A D 11J
X3001	A D 12F
X3002	A D 12F

■ MAIN CIRCUIT BOARD

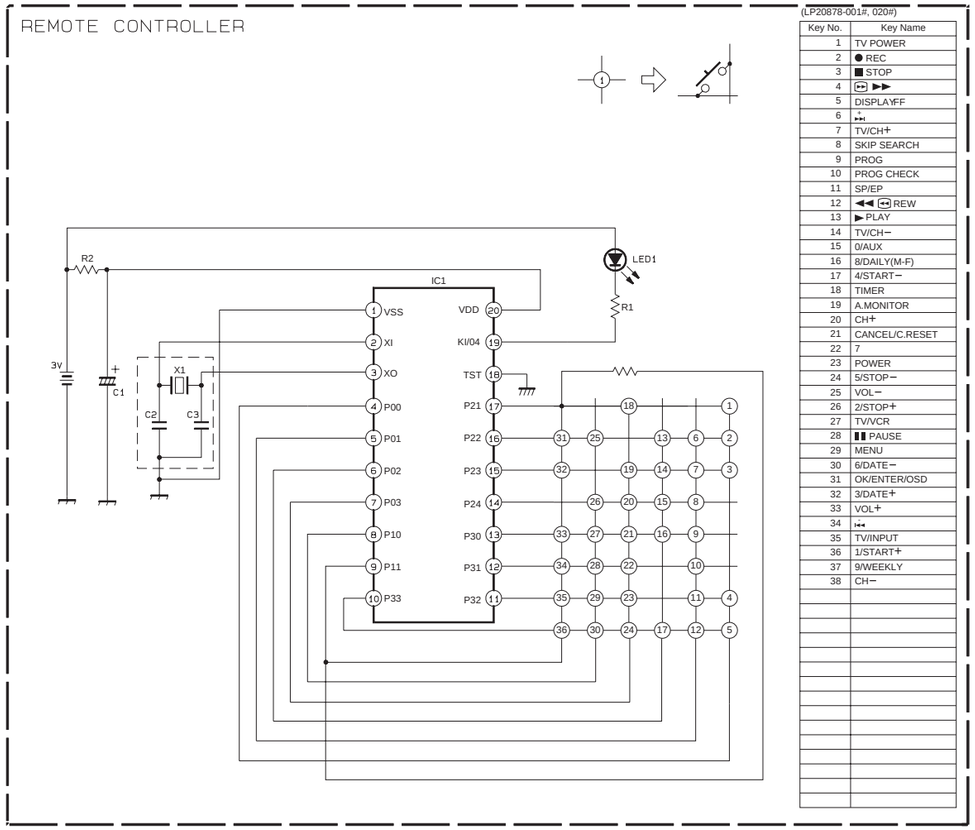
CAUTION :
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATED FUSE(S).
ATTENTION :
REPLACER PAR DES FUSIBLE DE MEME TYPE.

<03> MAIN
LPB10195-001B



REMOTE CONTROLLER SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.

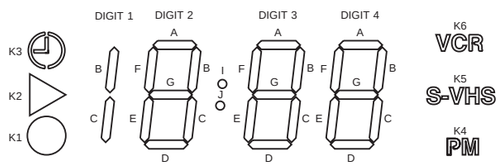


(LP20878-001#, 020#)

Key No.	Key Name
1	TV POWER
2	● REC
3	■ STOP
4	◄◄ ►►
5	DISPLAY/FF
6	►►
7	TV/CH+
8	SKIP SEARCH
9	PROG
10	PROG CHECK
11	SP/EP
12	◄◄ REW
13	► PLAY
14	TV/CH−
15	0/AUX
16	8/DAILY(M-F)
17	4/START−
18	TIMER
19	A.MONITOR
20	CH+
21	CANCEL/C.RESET
22	7
23	POWER
24	5/STOP−
25	VOL−
26	2/STOP+
27	TV/VCR
28	▮▮ PAUSE
29	MENU
30	6/DATE−
31	OK/ENTER/OSD
32	3/DATE+
33	VOL+
34	►►
35	TV/INPUT
36	1/START+
37	9/WEEKLY
38	CH−

FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT



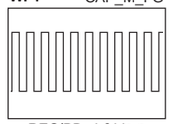
ANODE CONNECTION

No.	CONNECTION
1	CATHODE 2G, 3G, 4G, I, J
2	CATHODE 2F, 3F, 4F, K6
3	CATHODE 2E, 3E,4E, K1
4	CATHODE 2D, 3D, 4D, K4
5	CATHODE 1C, 2C, 3C, 4C, K5
6	CATHODE 1B, 2B, 3B, 4B, K2
7	CATHODE 2A, 3A, 4A, K3
8	COMMON ANODE K3, K2, K5, K4, K1, K6, I, J
9	COMMON ANODE DIGIT4
10	COMMON ANODE DIGIT3
11	COMMON ANODE DIGIT2
12	COMMON ANODE DIGIT1

WAVEFORMS

< SYSCON >

WF1 CN3001-1 CAP_M_FG

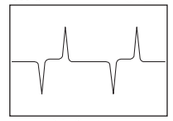


REC/PB 4.6 Vp-p
1 V/0.5 msec/DIV

WF2 CN3001-11 D. PG/FG

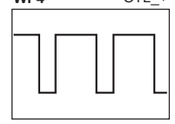
REC/PB 4.5 Vp-p
1 V/5 msec/DIV

WF3 TP4001 CTL.P



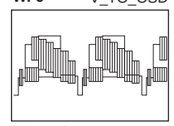
PB 2.7 Vp-p
50 mV/5 msec/DIV

WF4 IC3001-74 CTL_+



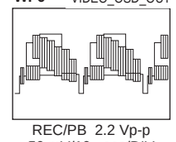
REC 4.0 Vp-p
0.1 V/10 msec/DIV

WF5 IC3001-49 V_TO_OSD



REC/PB 2.2 Vp-p
50 mV/10 ×sec/DIV

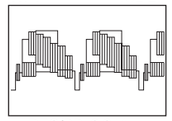
WF6 IC3001-47 VIDEO_OSD_OUT



REC/PB 2.2 Vp-p
50 mV/10 ×sec/DIV

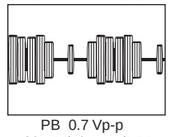
< VIDEO >

WF1 IC1-27



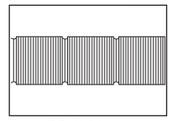
REC/PB 2.2 Vp-p
50 mV/10 ×sec/DIV

WF2 IC1-30



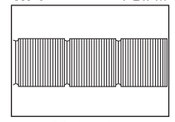
PB 0.7 Vp-p
20 mV/10 ×sec/DIV

WF3 IC1-1



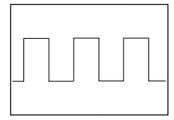
PB 0.4 Vp-p
20 mV/5 msec/DIV

WF4 TP106 PB.FM



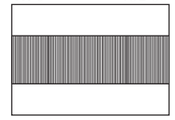
PB 0.4 Vp-p
20 mV/5 msec/DIV

WF5 TP111 D.FF



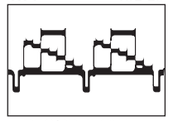
REC/PB 3.5 Vp-p
0.1 V/10 msec/DIV

WF6 IC1-85



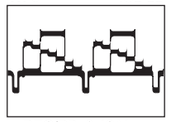
REC 2.0 Vp-p
50 mV/2 msec/DIV

WF7 IC1-13



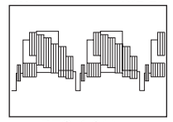
REC/PB 0.48 Vp-p
20 mV/10 ×sec/DIV

WF8 IC1-11



REC/PB 0.48 Vp-p
20 mV/10 ×sec/DIV

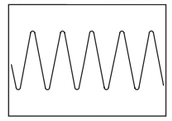
WF9 IC1-16



REC 1.0 Vp-p
20 mV/10 sec/DIV

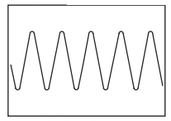
< AUDIO >

WF1 IC2201-9



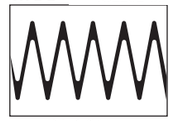
REC 0.45 Vp-p
20 mV/0.5 msec/DIV

WF2-1 IC2201-53



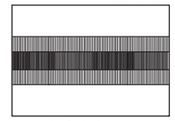
REC 4.0 Vp-p
0.1 V/0.2 msec/DIV

WF2-2 IC2201-53



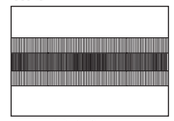
PB 1.0 Vp-p
20 mV/0.2 msec/DIV

WF3 IC2201-21



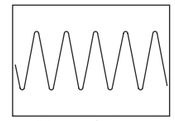
REC 1.0 Vp-p
50 mV/2 msec/DIV

WF4 TP2253 A.PB.FM



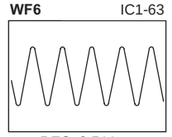
PB 1.0 Vp-p
50 mV/0.5 msec/DIV

WF5 IC1-53



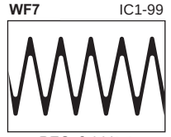
REC 1.4 Vp-p/PB 1.5 Vp-p
50 mV/0.5 msec/DIV

WF6 IC1-63



REC 0.5 Vp-p
10 mV/0.2 msec/DIV

WF7 IC1-99



REC 2.1 Vp-p
50 mV/0.2 msec/DIV

■ VOLTAGE CHARTS

<MAIN>

MODE PIN NO.	REC	PLAY
IC1		
1	2.1	2.1
2	2.8	2.8
3	2.5	2.5
4	1.9	1.4
5	0	1.4
6	2.4	2.1
7	3.0	0.7
8	0	0
9	2.6	3.0
10	2.4	2.4
11	3.1	0
12	2.7	2.4
13	3.1	0
14	2.3	2.3
15	0	0
16	2.8	2.8
17	1.4	0
18	2.8	2.8
19	2.7	0
20	2.8	2.8
21	2.0	2.0
22	2.8	2.8
23	2.8	2.8
24	5.0	5.0
25	0.3	0.3
26	0	0
27	2.3	2.3
28	2.3	2.5
29	1.8	1.8
30	2.1	2.1
31	0	0
32	0	2.5
33	2.5	5.0
34	5.0	1.0
35	5.0	5.0
36	2.5	2.5
37	2.3	2.3
38	2.8	2.8
39	1.3	1.3
40	1.6	1.6
41	0	2.5
42	0	2.1
43	0	0
44	0	2.2
45	4.3	4.5
46	0	4.5
47	0	2.8
48	2.5	2.5
49	5.0	5.0
50	2.5	2.5
51	2.7	2.7
52	0	0
53	2.5	2.5
54	0	0
55	0	0
56	0	0
57	0	0
58	0	0
59	0	0
60	0	0
61	0	0
62	0	0
63	0	0
64	0	0
65	2.0	2.0
66	0	0
67	0	0
68	0	0
69	0	0
70	0	0
71	0	0
72	0	0
73	3.0	0
74	0	0
75	0	0
76	0	0
77	0	0
78	0	0
79	5.0	5.0
80	5.0	5.0
81	0	0
82	0	0
83	0	0
84	0	2.2
85	0	2.2
86	0	2.2
87	0	5.0
88	0	0
89	0	0
90	0	0
91	0	0
92	0	0
93	2.5	0
94	0	0
95	2.5	2.9
96	2.5	2.5
97	2.5	2.5
98	0	0
99	2.5	2.5
100	0	0

MODE PIN NO.	REC	PLAY
IC2201		
1	2.2	2.2
2	0	0
3	2.3	0
4	0	0
5	2.3	0
6	0	0
7	2.0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	2.0	2.0
13	2.5	2.5
14	0	0
15	0	0
16	0	2.5
17	0	0
18	2.5	0
19	2.5	2.5
20	2.0	0
21	2.0	0
22	2.0	0.7
23	0	0
24	2.0	0.6
25	5.0	5.0
26	2.0	0
27	0	2.5
28	4.3	2.0
29	4.1	1.8
30	2.2	1.0
31	0	1.9
32	2.4	2.4
33	2.5	2.5
34	0	0.6
35	2.5	2.5
36	0	0
37	1.7	1.7
38	0	0
39	0	0
40	5.0	5.0
41	0	0
42	4.8	4.8
43	4.7	4.7
44	2.5	2.5
45	0	0
46	0	3.5
47	2.5	2.5
48	2.2	2.2
49	3.5	3.5
50	3.0	3.0
51	5.0	5.0
52	2.6	2.6
53	4.3	4.3
54	2.4	2.4
55	0	0
56	0	0.6
57	4.4	4.4
58	8.9	8.9
59	4.4	4.4
60	0.8	0.5
61	2.5	2.5
62	2.4	2.4
63	2.6	2.6
64	0	0
IC3001		
1	–	–
2	–	–
3	0	0
4	0	0
5	4.6	4.6
6	1.0	0
7	1.0	1.0
8	1.0	0
9	0	0
10	2.0	0
11	1.0	1.0
12	2.0	3.6
13	0	0
14	0	0
15	0	0
16	0	0
17	4.8	4.5
18	4.5	4.5
19	0	0
20	0	0
21	2.8	2.8
22	5.0	5.0
23	2.5	2.5
24	0	0
25	4.9	4.9
26	0	2.4
27	0	0
28	4.7	0
29	0	0
30	0	0
31	4.7	4.7
32	4.8	4.8
33	2.6	2.6
34	2.6	2.6
35	0	0

MODE PIN NO.	REC	PLAY
36	–	–
37	–	–
38	0	–
39	0	0
40	0	0
41	0	0
42	0	0
43	–	–
44	4.9	4.9
45	0	0
46	0	4.9
47	1.7	1.7
48	0	0
49	1.7	1.7
50	2.3	2.3
51	5.0	5.0
52	2.5	2.5
53	2.5	2.5
54	0	0
55	0	0
56	0	0
57	4.8	4.8
58	0	4.9
59	4.8	4.8
60	0	0
61	2.5	2.5
62	2.5	2.5
63	0	0
64	0	0
65	1.3	1.3
66	4.9	4.4
67	2.3	2.3
68	2.3	2.3
69	2.5	2.5
70	2.5	2.5
71	0	0
72	2.4	2.4
73	5.0	5.0
74	2.9	2.4
75	2.0	2.4
76	2.5	2.5
77	4.2	4.4
78	4.8	4.8
79	2.4	2.4
80	–	–
81	4.2	2.0
82	0	0
83	0	2.2
84	2.4	2.4
85	0	0
86	0	0
87	0	0
88	4.9	4.9
89	4.9	4.9
90	0	0
91	0	0
92	4.9	4.9
93	0	0
94	4.9	4.9
95	3.9	3.9
96	3.9	3.9
97	3.9	3.9
98	3.9	3.9
99	3.9	3.9
100	4.2	0
IC7002		
1	4.5	4.5
2	4.9	4.9
3	0	0
Q22		
E	1.6	1.6
C	5.0	5.0
B	2.2	2.2
Q38		
E	1.9	2.1
C	4.9	4.9
B	2.6	2.6
Q901		
E	–	2.3
C	0	0
B	1.6	0
Q2001		
E	0	0
C	0	0
B	-18.2	0.7
Q2002		
E	-12.2	0
C	0	0
B	-18.0	0.7
Q2003		
E	5.0	5.0
C	-18.9	0
B	4.9	0
Q2051		
E	0	0
C	7.4	0
B	0.5	0
Q2052		
E	10.9	10.9
C	10.5	2.4
B	10.0	11.0

MODE PIN NO.	REC	PLAY
Q2053		
E	0	0
C	0	10.9
B	4.9	0
Q2054		
E	10.5	2.5
C	10.2	0
B	9.8	2.4
Q2055		
E	0	0
C	0	2.2
B	4.9	0
Q2201		
E	4.8	0
C	-2.4	-3.0
B	4.8	5.0
Q2202		
E	0	0
C	4.7	5.0
B	0	0
Q2203		
E	0	0
C	0	0
B	-2.3	-2.0
Q2204		
E	0	0
C	0	0
B	-2.9	-2.9
Q3006		
E	0	0
C	4.8	5.0
B	0	0
Q3007		
E	0	0
C	0	0
B	0.7	0.7
Q4001		
E	0	0
C	0	0
B	4.8	4.8
Q4002		
E	4.9	4.9
C	5.6	5.6
B	5.6	5.6
Q5101		
S	0	0
D	136	136
G	3.8	3.8
Q5102		
E	0.4	0.4
C	3.8	3.8
B	0	0
Q5301		
E	0	0
C	4.2	4.2
B	0.6	0.6
Q5304		
E	10.8	10.8
C	12.2	12.2
B	11.5	11.5
Q5305		
E	11.4	11.4
C	11.4	11.4
B	0	0
Q5306		
E	0	0
C	0	0
B	4.8	4.8
Q5321		
E	5.1	5.1
C	5.7	5.7
B	5.8	5.8
Q6030		
E	-5.0	2.6
C	-7.0	0
B	-5.0	2.0
Q7001		
E	4.9	4.9
C	1.2	0.7
B	3.9	3.9
Q7002		
E	4.9	4.9
C	0.5	0
B	3.9	3.9
Q7003		
E	4.9	4.9
C	0	0
B	0	4.0
Q7004		
E	4.9	4.9
C	0	0
B	3.9	3.9
Q7005		
E	4.9	4.9
C	0.8	0
B	3.9	3.9
Q7006		
E	0	0
C	3.6	5.5
B	1.0	0

MODE PIN NO.	REC	PLAY
Q7007		
E	0	0
C	3.5	4.4
B	1.0	1.0
Q7008		
E	0	0
C	4.0	5.3
B	1.0	0
Q7009		
E	0	0
C	4.8	5.3
B	0	0
Q7010		
E	0	0
C	2.4	5.4
B	1.9	0
Q7011		
E	0	0
C	3.7	3.7
B	1.0	1.0
Q7012		
E	0	0
C	2.7	0.5
B	1.9	3.7
CN1		
1	0	0
2	0	0
3	0	0
4	15.0	2.3
5	15.0	2.3
6	15.0	2.3
7	15.0	0
8	15.0	0
9	15.0	0
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.4	2.4
6	2.6	2.6
CN2002		
1	0	0
2	0	0
CN3001		
1	–	2.4
2	11.5	12.2
3	5.3	5.0
4	0	0
5	6.6	7.3
6	0	0
7	0	0
8	11.5	12.2
9	2.0	2.7
10	1.8	2.5
11	1.8	1.4
12	1.9	2.6

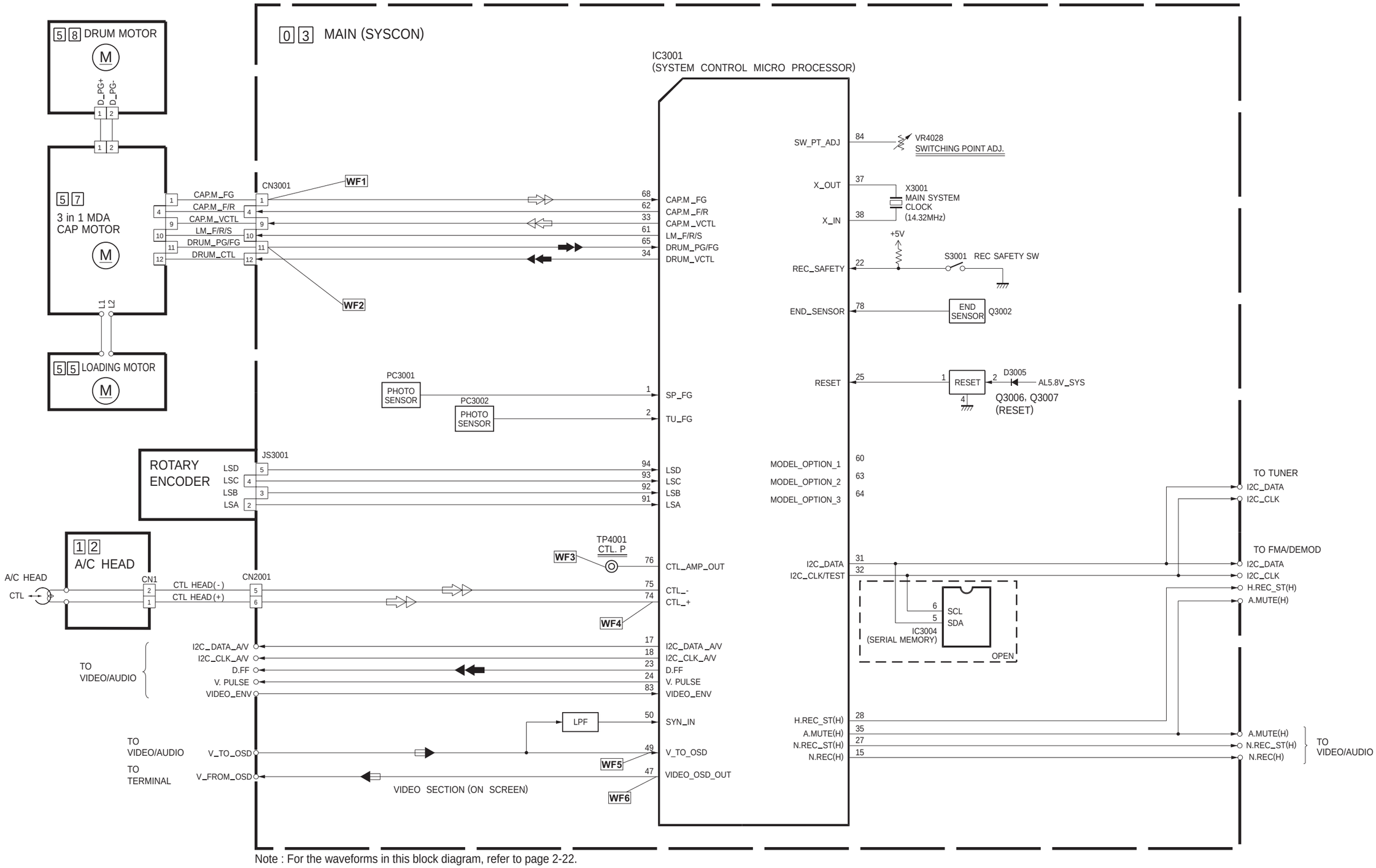
■ CPU PIN FUNCTION

<SYSCON IC3001>

PIN NO.	LABEL	IN/OUT	FUNCTION
1	SP_FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
2	TU_FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
3	R.PAUSE/COMP_IN	IN	REMOTE PAUSE CONTROL/A/V COMPULINK INPUT
4	NC	-	NC
5	RC	IN	REMOTE CONTROL DATA INPUT
6	D_A	OUT	LED DRIVE
7	D_B	OUT	LED DRIVE
8	D_C	OUT	LED DRIVE
9	D_D	OUT	LED DRIVE
10	D_E	OUT	LED DRIVE
11	D_F	OUT	LED DRIVE
12	D_G	OUT	LED DRIVE
13	NC	-	NC
14	NC	-	NC
15	N. REC[H]	OUT	NORMAL AUDIO REC MODE(REC:H)
16	AGC_CTL	IN	DETECTION SIGNAL FOR AGC
17	I2C_DATA_A/V	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR THE VIDEO/AUDIO IC
18	I2C_CLK_A/V	OUT	SERIAL DATA TRANSFER CLOCK FOR THE VIDEO/AUDIO IC
19	NC	-	NC
20	NC	-	NC
21	SB_GAIN	OUT	VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE
22	REC_SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON:L)
23	D.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
24	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
25	RESET	-	RESET TERMINAL
26	A.FF	OUT	AUDIO FF OUTPUT
27	N.REC_ST(H)	OUT	NORMAL AUDIO REC START:H
28	H.REC_ST(H)	OUT	HiFi AUDIO REC START:H
29	NC	-	NC
30	NC	-	NC
31	I2C_DATA	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR MEMORY IC
32	I2C_CLK/TEST	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC/MECHANISM TEST SIGNAL
33	CAP_CTL_V	OUT	CAPSTAN MOTOR CONTROL
34	DRUM_CTL_V	OUT	DRUM MOTOR CONTROL
35	A.MUTE(H)	OUT	AUDIO MUTE CONTROL (MUTE ON:H)
36	VDD	-	SYSTEM POWER
37	X_OUT	-	MAIN SYSTEM CLOCK (14.32MHz)
38	X_IN	-	MAIN SYSTEM CLOCK (14.32MHz)
39	VSS	-	GND
40	XC_IN	-	TIMER CLOCK(32KHz)
41	XC_OUT	-	TIMER CLOCK(32KHz)
42	CLK_SEL	IN	SELECT FOR BACKUP METHOD(LITHIUM OR E.CAPACITOR):H
43	CH_SW	OUT	RF CHANNEL SWITCHING
44	P.MUTE	OUT	TUNER VIDEO MUTE CONTROL (MUTE:H)
45	P20	-	NC
46	CONV_CTL[H]	IN	R/F CONVERTER ON/OFF CONTROL
47	VIDEO_OSD_OUT	OUT	COMPOSITE VIDEO SIGNAL OUTPUT
48	VSS2	-	GND
49	V_TO_OSD	IN	COMPOSITE VIDEO SIGNAL INPUT
50	SYN_IN	IN	COMPOSITE SYNCHRONIZING SIGNAL FOR SERVO, VERTICAL SYNCHRONIZING SIGNAL FOR OSD

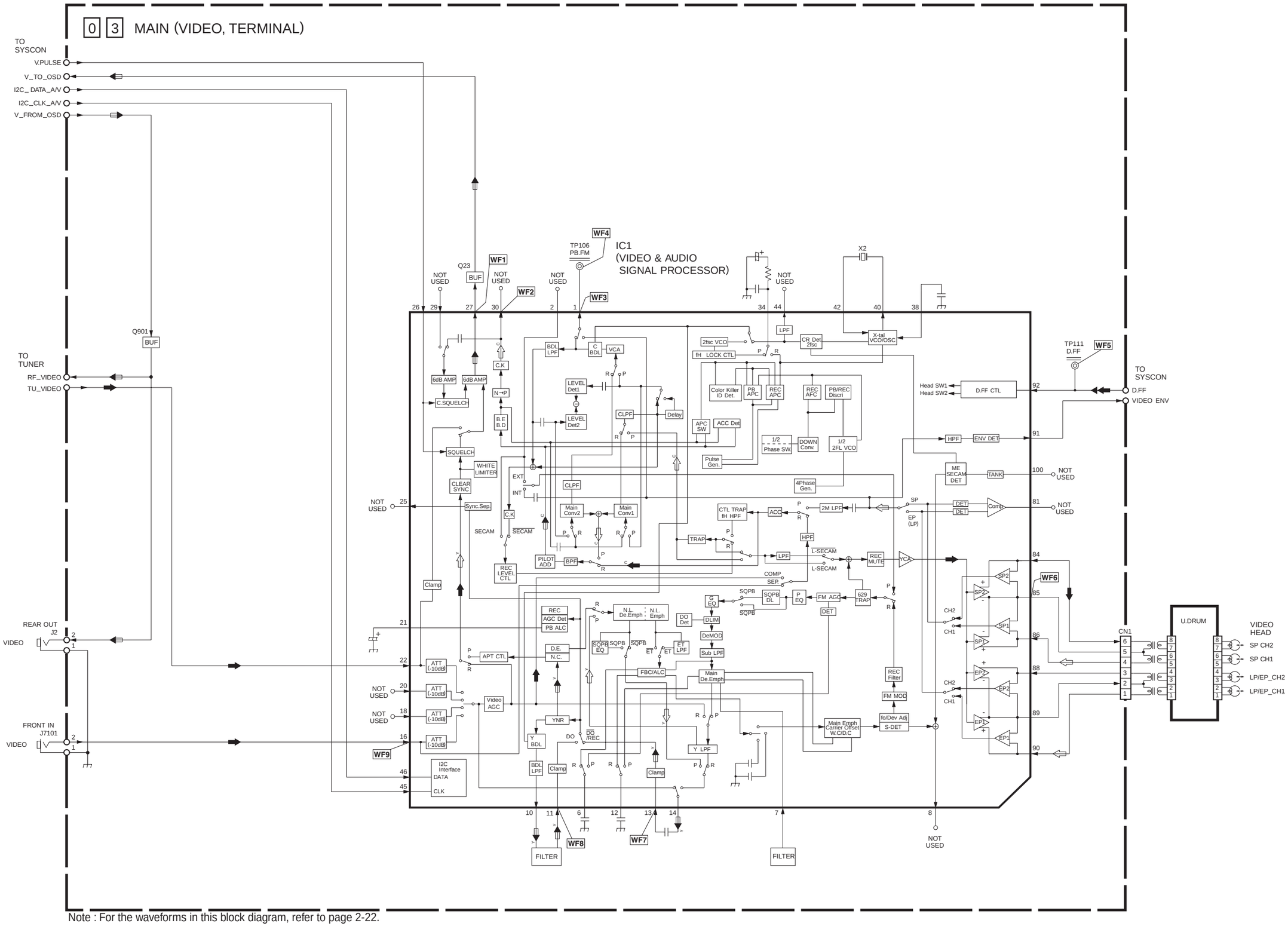
PIN NO.	LABEL	IN/OUT	FUNCTION
51	VDD2	-	SYSTEM POWER
52	AFCC	IN	FILTER INPUT FOR HORIZONTAL SYNCHRONIZING OF OSD CHARACTER
53	AFCLPF	OUT	FILTER OUTPUT FOR HORIZONTAL SYNCHRONIZING OF OSD CHARACTER
54	FSCI	IN	FSC INPUT FOR OSD
55	FSCLPF	OUT	FSC OUTPUT FOR OSD
56	NC	-	NC
57	CTL_GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
58	START_SENSOR_DEL	-	SETTING OF START SENSOR (ENABLE:L, DISABLE:H)
59	P.CTL [H]	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY
60	MODEL_OPTION1	-	MODEL SWITCH 1
61	LM_F/R/S	OUT	LOADING MOTOR DRIVE
62	CAP. M_F/R	OUT	CAPSTAN MOTOR DRIVE
63	MODEL_OPTION2	-	MODEL SWITCH 2
64	MODEL_OPTION3	-	MODEL SWITCH 3
65	D.FG_IN	IN	DRUM FG PULSE INPUT
66	EEPROM_DET	-	SETTING OF EEPROM (ENABLE:L, DISABLE:H)
67	C. FG_AMP_OUT	OUT	SET-UP OUTPUT FOR CAPSTAN FG AMPLIFICATION FACTOR
68	C.FG_IN	IN	CAPSTAN FG PULSE INPUT
69	AMP_VREF_OUT	OUT	AMP CIRCUIT REFERENCE VOLTAGE OUTPUT
70	AMP_VREF_IN	IN	AMP CIRCUIT REFERENCE VOLTAGE INPUT
71	AVSS	-	GND FOR ANALOG CIRCUIT
72	AMP_C	IN	CAPACITOR CONNECT TERMINAL FOR CTL AMP CIRCUIT
73	AVCC	-	SYSTEM POWER FOR ANALOG CIRCUIT
74	CTL(+)	IN/OUT	CONTROL SIGNAL(+)
75	CTL(-)	IN/OUT	CONTORL SIGNAL(-)
76	CTL_AMP_OUT	OUT	CTL PULSE OUTPUT
77	PROTECT	IN	DETECTION SIGNAL FOR SWITCHING POWER SUPPLY
78	END_SENSOR	IN	END SENSOR
79	AFC/JUST_CLK	IN	TUNING CHECK/JUST CLK INPUT
80	LED	IN	SAP DETECT
81	A. ENV/ND [L]	IN	AUDIO PB FM ENV. INPUT/NON HiFi MODEL:L
82	COMP_OUT	OUT	A/V COMPULINK OUTPUT
83	VIDEO_ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
84	SW_PT_ADJ	IN	INPUT FOR VALUE OF SWITCHING POINT ADJUSTMENT
85	START_SENSOR	IN	START SENSOR
86	JSA	IN	INPUT FOR THE JOG SHUTTLE
87	JSB	IN	INPUT FOR THE JOG SHUTTLE
88	KEY1	IN	OPERATION CONTROL SIGNAL
89	KEY2	IN	OPERATION CONTROL SIGNAL
90	POWER_DET	IN	DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY
91	LSA	IN	MECHANISM MODE DETECT(A)
92	LSB	IN	MECHANISM MODE DETECT(B)
93	LSC	IN	MECHANISM MODE DETECT(C)
94	LSD	IN	MECHANISM MODE DETECT(D)
95	DIG1	OUT	LED DRIVE
96	DIG2	OUT	LED DRIVE
97	DIG3	OUT	LED DRIVE
98	DIG4	OUT	LED DRIVE
99	DIG5	OUT	LED DRIVE
100	REC_LINK_LED	-	NC

■ SYSTEM CONTROL BLOCK DIAGRAM



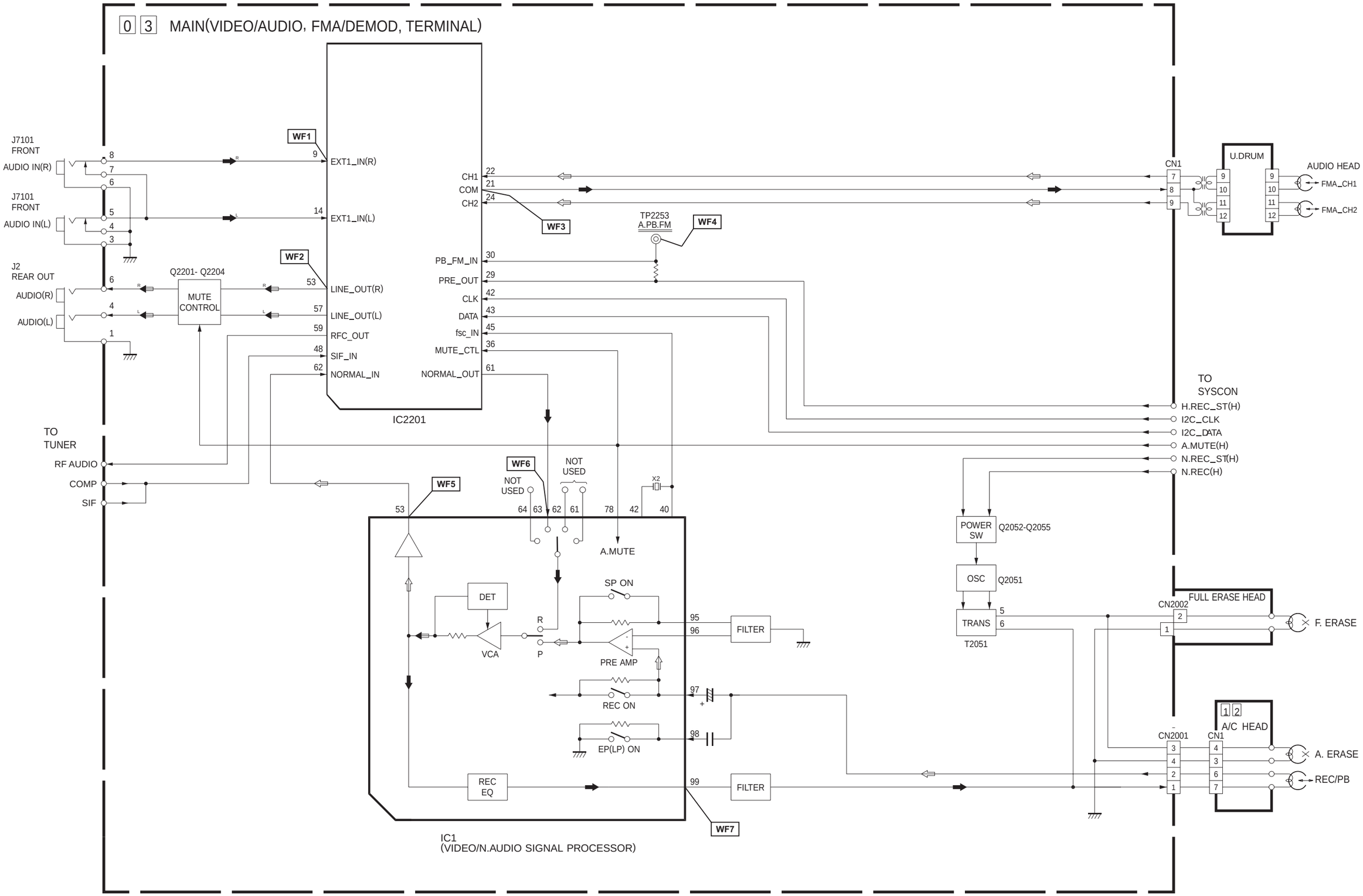
Note : For the waveforms in this block diagram, refer to page 2-22.

■ VIDEO BLOCK DIAGRAM



Note : For the waveforms in this block diagram, refer to page 2-22.

■ AUDIO BLOCK DIAGRAM



Note : For the waveforms in this block diagram, refer to page 2-22.

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PARTS LIST

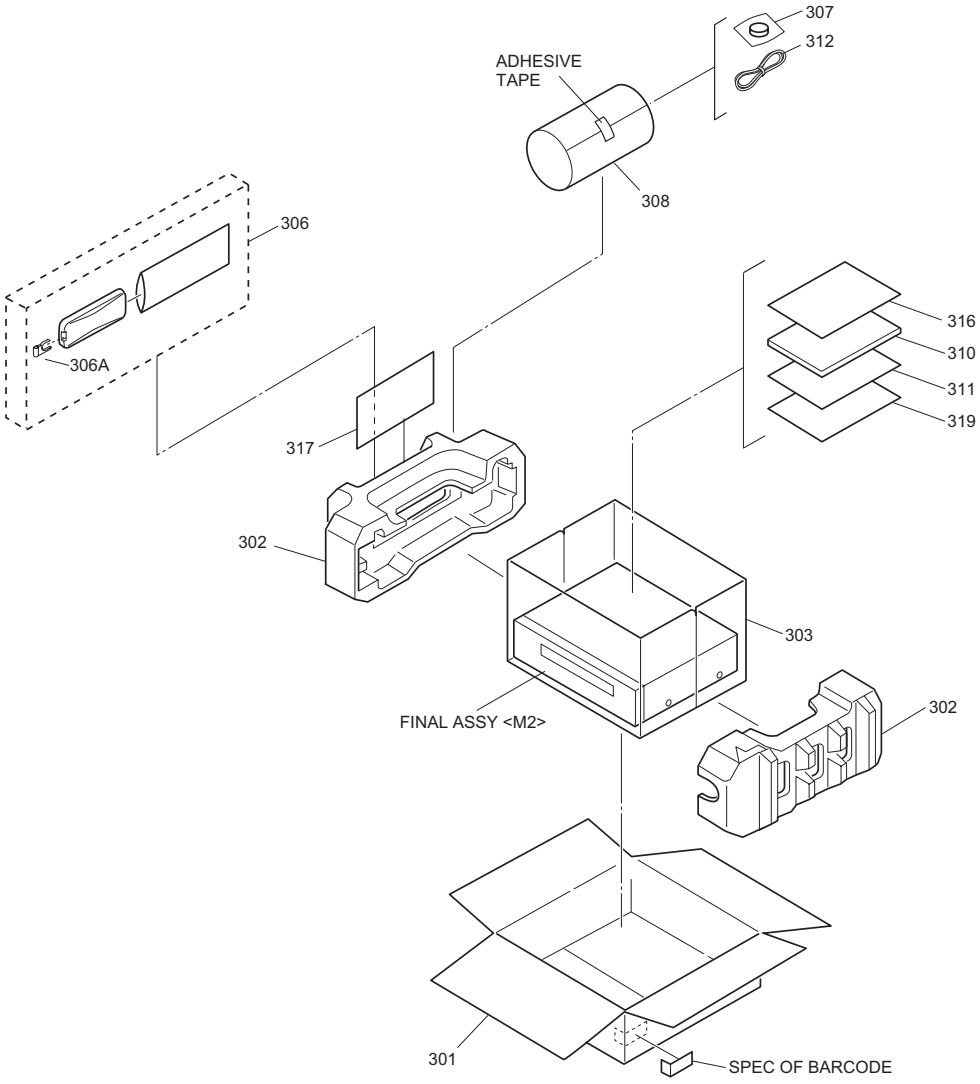
SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

1. EXPLODED VIEW

1.1 PACKING AND ACCESSORY ASSEMBLY <M1>

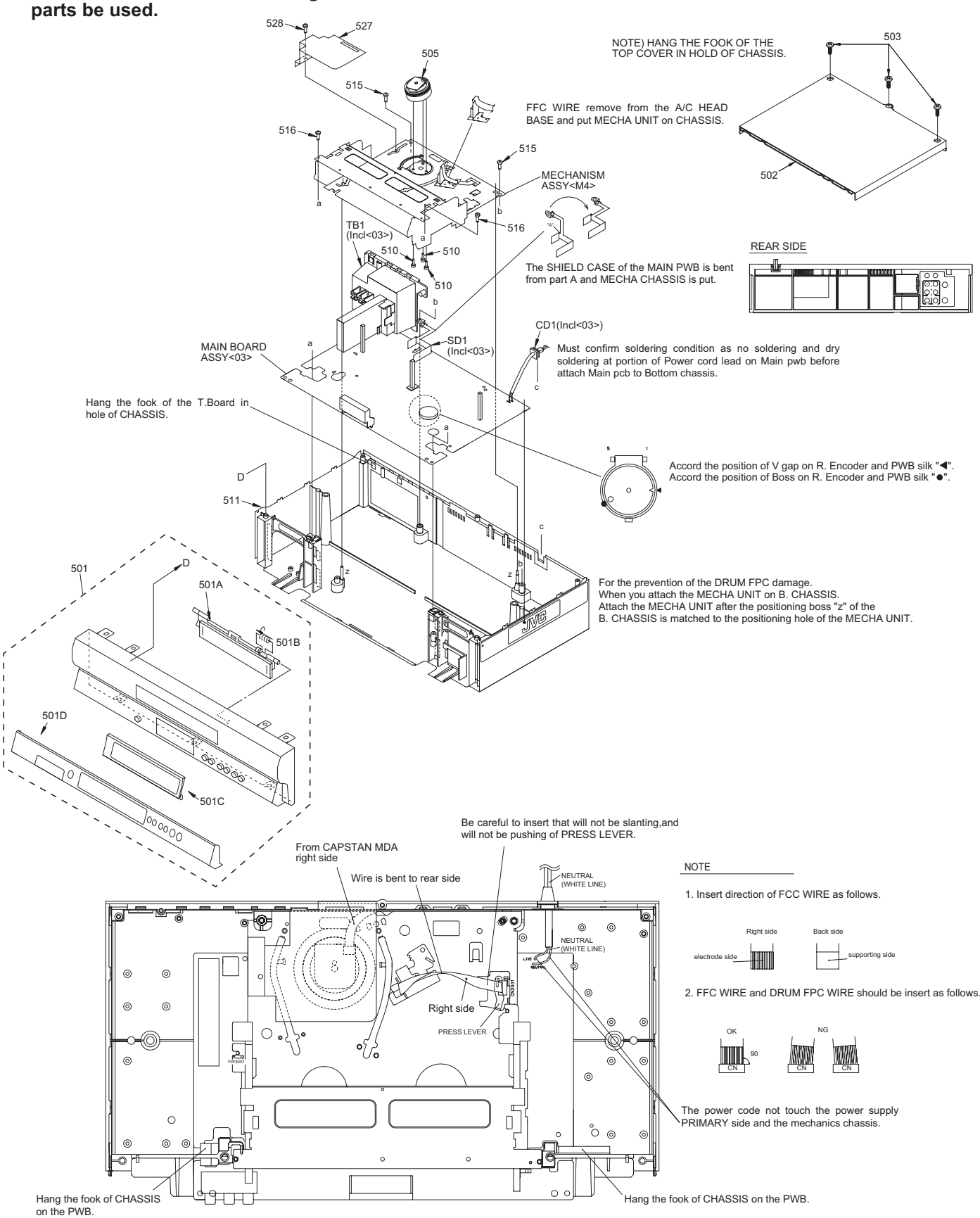
The instruction manual to be provided with this product will differ according to the destination.



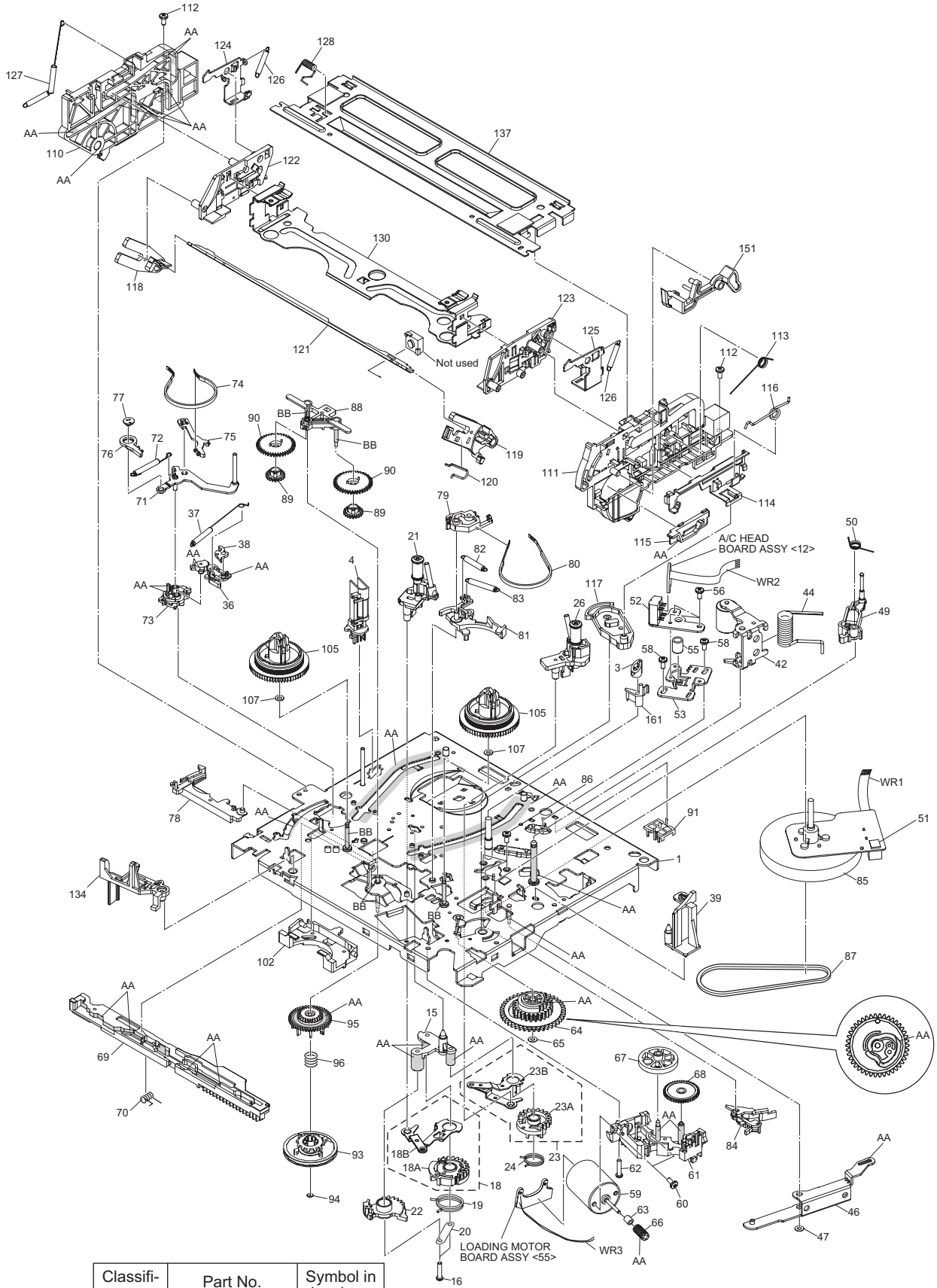
1.2 FINAL ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.


528
527
505
515
516
515
516
MECHANISM ASSY<M4>
TB1 (Incl<03>)
510
510
510
FFC WIRE remove from the A/C HEAD BASE and put MECHA UNIT on CHASSIS.
NOTE) HANG THE FOOK OF THE TOP COVER IN HOLD OF CHASSIS.
503
502
REAR SIDE
The SHIELD CASE of the MAIN PWB is bent from part A and MECHA CHASSIS is put.
CD1(Incl<03>)
SD1 (Incl<03>)
MAIN BOARD ASSY<03>
Must confirm soldering condition as no soldering and dry soldering at portion of Power cord lead on Main pwb before attach Main pcb to Bottom chassis.
Hang the fook of the T.Board in hole of CHASSIS.
Accord the position of V gap on R. Encoder and PWB silk "◀".
Accord the position of Boss on R. Encoder and PWB silk "●".
D
511
501
501A
501B
501D
501C
For the prevention of the DRUM FPC damage.
When you attach the MECHA UNIT on B. CHASSIS.
Attach the MECHA UNIT after the positioning boss "z" of the
B. CHASSIS is matched to the positioning hole of the MECHA UNIT.
Be careful to insert that will not be slanting,and will not be pushing of PRESS LEVER.
From CAPSTAN MDA right side
Wire is bent to rear side
NEUTRAL (WHITE LINE)
NEUTRAL (WHITE LINE)
Right side
PRESS LEVER
NOTE
1. Insert direction of FCC WIRE as follows.
Right side
Back side
electrode side
supporting side
2. FFC WIRE and DRUM FPC WIRE should be insert as follows.
OK
NG
90
CN
CN
CN
The power code not touch the power supply PRIMARY side and the mechanics chassis.
Hang the fook of CHASSIS on the PWB.
Hang the fook of CHASSIS on the PWB.

1.3 MECHANISM ASSEMBLY <M4>



Classification	Part No.	Symbol in drawing
Grease	KYODO-SH-JB	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in **AA** and **BB** indicate lubrication and greasing areas.

2. PARTS LIST

PACKING AND ACCESSORY ASSEMBLY <M1>

⚠ Symbol No.	Part No.	Part Name	Description	Local
301	LP31089-060B	PACKING CASE		
302	LP31091-001C	CUSHION ASSY		
303	LP41038-001A	POLY BAG		
306	LP21138-001C	REMOCON		
306A	LP40991-001B	COVER(BATTERY)		
⚠ 307	QAB0057-001	LI BATTERY		
308	QPC02202230P	POLY BAG	22cm x 22cm	
⚠ 310	LPT0729-001B	INST BOOK(EN)		
⚠ 310	LPT0729-002B	INST BOOK(FR)	J692UC	
311	LPT0730-003A	SHEET (SETTING)		
312	PEAC0294-04	RF CABLE		
316	BT-52006-2	WARRANTY CARD	J692UC	
317	BT-51028-2	REGIST.CARD	J692US	
319	BT-20071B	SERVICE NET CARD	J692UC	

FINAL ASSEMBLY <M2>

⚠ Symbol No.	Part No.	Part Name	Description	Local
501	LP10464-009C	FRONT PANEL ASSY		
501A	LP21080-011A	CASSETTE DOOR		
501B	PQ46448	TORSION SPRING		
501C	LP31161-001A	WINDOW		
501D	LP10448-009B	COVER		
⚠ 502	LP10418-001C	TOP COVER		
503	QYTDSF3010M	TAP SCREW	3mm x 10mm(x3)	
505	PDV2531A	DRUM FINAL ASSY		
510	QYSPSPD3008Z	SCREW	3mm x 8mm(x3)	
⚠ 511	LP10417-001C	BOTTOM CHASSIS		
515	QYSDSF4012Z	TAP SCREW	4mm x 12mm(x2)	
516	QYSPSF3010Z	TAP SCREW	3mm x 10mm(x2)	
527	LP21101-001A	DRUM SHIELD		
528	QYSPST2606Z	TAP SCREW	2.6mm x 6mm	

MECHANISM ASSEMBLY<M4>

⚠ Symbol No.	Part No.	Part Name	Description	Local
1	LP21039-001S	MAIN DECK ASSY		
3	LP40097-002D	G.POLE CAP		
4	QAH0082-001	FE HEAD		
15	LP30958-001B	LOAD.GEAR BASE		
16	QYTPST2620Z	TAP SCREW	2.6mm x 20mm(x2)	
18	LP40798-001A	L.GEAR(S) ASSY		
18A	LP21040-001A	L.GEAR(S)		
18B	LP40799-001A	L.ARM(S) ASSY		
19	LP40837-001A	TOR.SPRING(S)		
20	LP40903-001A	FIXING PLATE		
21	LP40806-001D	P.BASE ASSY(S)		
22	LP30959-002A	LOAD GEAR		
23	LP40802-001C	L.GEAR(T) ASSY		
23A	LP21041-001C	L.GEAR(T)		
23B	LP40803-001A	L.ARM(T) ASSY		
24	LP40838-001A	TOR.SPRING(T)		
26	LP40808-001E	P.BASE ASSY(T)		
36	LP21055-001E	TU LEVER		
37	LP40943-001A	TENSION SPRING		
38	LP40859-001D	T-UP HEAD		
39	LP30961-001C	LID GUIDE		
42	LP40810-001A	P.R.ARM ASSY		
44	LP40840-001D	TORSION SPRING		
46	LP30963-001B	PRESS LEVER		
47	PQM30017-24	SLIT WASHER		
49	LP40813-001D	G.ARM ASSY		
50	LP40841-001A	TORSION SPRING		
51	LP30002-090A	SPACER		
52	QAH0081-001	AC HEAD		
53	LP30965-001A	HEAD BASE		
55	LP40842-001D	COMP.SPRING		
56	LP41036-001A	A/C ADJ SCREW	(x3)	
57	-	-	-	
58	QYTDST2606Z	TAP SCREW	2.6mm x 6mm(x2)	
59	QAR0023-001	LOADING MOTOR		
60	QYTPSP3003Z	SCREW	3mm x 3mm(x2)	
61	LP21056-002G	MOTOR BRACKET		
62	QYTPST2620Z	TAP SCREW	2.6mm x 20mm	
63	LP40814-001B	WORM BEARING		
64	LP21044-001D	CONTROL CAM		
65	PQM30017-24	SLIT WASHER		
66	LP40815-001A	WORM GEAR		
67	LP40816-001B	HELICAL GEAR		
68	LP40817-001A	CONNECT GEAR		
69	LP10400-001J	CONTROL PLATE		
70	LP40843-001A	TOR.SPRING		
71	LP40818-001B	T.ARM ASSY		
72	LP40844-001E	TENSION SPRING		
73	LP21045-001D	T.ARM BASE		
74	LP40821-001A	T.BAND ASSY		
75	LP30967-001B	BAND HOLDER-1		
76	LP30968-001C	BAND HOLDER-2		
77	LP40822-002B	ADJUST PIN		
78	LP31000-005E	T.ARM LEVER		
79	LP21046-001C	MAIN BRAKE(T)		
80	LP40824-001A	BAND BRAKE ASSY		
81	LP30969-002B	BRAKE LEVER		
82	LP30003-033B	TENSION SPRING		
83	LP30003-035B	TENSION SPRING		
84	LP40825-001B	CAP.BRAKE ASSY		
⚠ 85	QAR0204-002	CAPSTAN MOTOR		
86	QYTPSG2606Z	TAP SCREW	2.6mm x 6mm(x3)	
87	LP30005-010A	BELT	CAPSTAN MOTOR	
88	LP30970-001A	IDLER ARM		
89	LP40828-004A	IDLER GEAR 1	(x2)	
90	LP40829-002A	IDLER GEAR 2	(x2)	
91	LP31014-001A	WIRE HOLDER		
93	LP40934-001B	CLUTCH UNIT		
94	PQM30017-47	SLIT WASHER		
95	LP30973-001A	DIRECT GEAR		
96	LP40939-001A	COMP. SPRING		
102	LP30974-001B	CHANGE LEVER		
105	LP21049-001A	REEL DISK	(x2)	
107	LP30017-004A	SPACER	REEL DISK(x2)	
110	LP10401-001H	SIDE FRAME(L)		
111	LP10402-001K	SIDE FRAME(R)		
112	QYTDST2606Z	TAP SCREW	2.6mm x 6mm(x2)	
113	LP40917-001D	TORSION SPRING		
114	LP30976-001E	SIDE PLATE		
115	LP30977-002D	LIMIT PLATE		
116	LP40846-001C	LIMIT SPRING		
117	LP31100-001B	DRIVE LEVER		
118	LP30978-001B	DRIVE ARM(L)		
119	LP30979-001N	DRIVE ARM(R)		
120	LP40847-001B	TORSION SPRING		
121	LP30980-001E	CONNECT PLATE		
122	LP10403-001C	SIDE HOLDER(L)		
123	LP10404-001E	SIDE HOLDER(R)		
124	LP30983-001B	LOCK LEVER(L)		
125	LP30984-001B	LOCK LEVER(R)		
126	LP40924-001D	TENSION SPRING	(x2)	
127	LP40972-001A	EARTH SPRING(1)		
128	LP40857-001B	EARTH SPRING(2)		
130	LP30981-001G	C.HOLDER ASSY		
134	LP21051-002C	R.SAFETY LEVER		
137	LP21052-001J	TOP FRAME		
151	LP30985-001G	DOOR OPENER		
161	LP40993-001A	TAPE GUIDE		
WR1	WJT0059-001E	E-CARD WIRE	CAP M - DRUM M	
WR2	WJT0067-001B	E-CARD WIRE	A/C HEAD CN2001	
WR3	WJS0022-001A	E-FL/RB WIRE	LOADING MOTOR	

MAIN BOARD ASSEMBLY <03>

⚠ Symbol No.	Part No.	Part Name	Description	Local
PW1	LPA10195-01B1	MAIN BOARD ASSY		
IC1	JCP8041-NVA	IC		
⚠ IC2201	AN3663FBP	IC		
IC3001	MN101D06GJN	IC(MCU)		
IC3001 or	MN101DF06KAFJN	IC(MCU)		
IC7002	GP1UM291QK	IR DETECT UNIT		
Q22	2SC4081/QRS/-X	TRANSISTOR		
Q22 or	2PC4081/R/-X	TRANSISTOR		
Q38	2SC4081/QRS/-X	TRANSISTOR		
Q38 or	2PC4081/R/-X	TRANSISTOR		
Q901	2SA1576A/QRS/-X	TRANSISTOR		
Q901 or	2PA1576/R/-X	TRANSISTOR		
Q901 or	2SA1576A/QR/-X	TRANSISTOR		
Q2001	2SC4081/QRS/-X	TRANSISTOR		
Q2001 or	2SD1819A/QRS/-X	TRANSISTOR		
Q2001 or	2PC4081/R/-X	TRANSISTOR		
Q2002	2SC4081/QRS/-X	TRANSISTOR		
Q2002 or	2SD1819A/QRS/-X	TRANSISTOR		
Q2002 or	2PC4081/R/-X	TRANSISTOR		
Q2003	DTA144WUA-X	DIGI TRANSISTOR		
Q2003 or	PDTA144WU-X	DIGI TRANSISTOR		
Q2003 or	UN511E-X	DIGI TRANSISTOR		
Q2003 or	RN2309-X	DIGI TRANSISTOR		
Q2051	2SC4081/QRS/-X	TRANSISTOR		
Q2051 or	2SD1819A/QRS/-X	TRANSISTOR		
Q2051 or	2PC4081/R/-X	TRANSISTOR		
Q2052	2SA1576A/QR/-X	TRANSISTOR		
Q2052 or	2SB1218A/QR/-X	TRANSISTOR		
Q2052 or	2PA1576/R/-X	TRANSISTOR		
Q2053	DTC144WUA-X	DIGI TRANSISTOR		
Q2053 or	PDTC144WU-X	DIGI TRANSISTOR		
Q2053 or	UN521E-X	DIGI TRANSISTOR		
Q2053 or	RN1309-X	DIGI TRANSISTOR		
Q2054	2SA1576A/QR/-X	TRANSISTOR		
Q2054 or	2SB1218A/QR/-X	TRANSISTOR		
Q2054 or	2PA1576/R/-X	TRANSISTOR		
Q2055	DTC144WUA-X	DIGI TRANSISTOR		
Q2055 or	PDTC144WU-X	DIGI TRANSISTOR		
Q2055 or	UN521E-X	DIGI TRANSISTOR		
Q2055 or	RN1309-X	DIGI TRANSISTOR		
Q2201	DTA144WUA-X	DIGI TRANSISTOR		
Q2201 or	PDTA144WU-X	DIGI TRANSISTOR		
Q2201 or	UN511E-X	DIGI TRANSISTOR		
Q2201 or	RN2309-X	DIGI TRANSISTOR		
Q2202	DTC144WUA-X	DIGI TRANSISTOR		
Q2202 or	PDTC144WU-X	DIGI TRANSISTOR		
Q2202 or	UN521E-X	DIGI TRANSISTOR		
Q2202 or	RN1309-X	DIGI TRANSISTOR		
Q2203	2SC4081/QRS/-X	TRANSISTOR		
Q2203 or	2PC4081/R/-X	TRANSISTOR		
Q2203 or	2SD1819A/QRS/-X	TRANSISTOR		
Q2204	2SC4081/QRS/-X	TRANSISTOR		
Q2204 or	2PC4081/R/-X	TRANSISTOR		
Q2204 or	2SD1819A/QRS/-X	TRANSISTOR		
Q3002	PTZ-NV16A	IC(PHOTO SENSOR		
Q3006	2SC4081/QRS/-X	TRANSISTOR		
Q3007	2SC4081/QRS/-X	TRANSISTOR		
Q4001	UN5211-X	DIGI TRANSISTOR		
Q4001 or	DTC114EUA-X	DIGI TRANSISTOR		
Q4001 or	RN1302-X	DIGI TRANSISTOR		
Q4001 or	PDTC114EU-X	DIGI TRANSISTOR		
Q4002	2SD1819A/QRS/-X	TRANSISTOR		
Q4002 or	2SC4081/QRS/-X	TRANSISTOR		
Q4002 or	2PC4081/R/-X	TRANSISTOR		
Q5101	2SK2043-CB14	FET		
Q5101 or	2SK2043	FET		
Q5102	2SD2144S/UV/-T	TRANSISTOR		
Q5301	2SC1740S/RS/-T	TRANSISTOR		
Q5301 or	2SC3199/YG/-T	TRANSISTOR		
Q5304	2SD2144S/UV/-T	TRANSISTOR		
Q5305	DTA114EUA-X	DIGI TRANSISTOR		
Q5305 or	UN5111-X	DIGI TRANSISTOR		
Q5305 or	RN2302-X	DIGI TRANSISTOR		
Q5305 or	PDTA114EU-X	DIGI TRANSISTOR		
Q5306	DTC114EUA-X	DIGI TRANSISTOR		
Q5306 or	UN5211-X	DIGI TRANSISTOR		
Q5306 or	RN1302-X	DIGI TRANSISTOR		
Q5306 or	PDTC114EU-X	DIGI TRANSISTOR		
⚠ Q5321	2SD1858/QR/-T	TRANSISTOR		
Q6030	2SB1218A/QR/-X	TRANSISTOR		
Q6030 or	2SA1576A/QR/-X	TRANSISTOR		
Q6030 or	2PA1576/R/-X	TRANSISTOR		
Q7001	DTA143TUA-X	DIGI TRANSISTOR		
Q7001 or	UN5116-X	DIGI TRANSISTOR		
Q7002	DTA143TUA-X	DIGI TRANSISTOR		
Q7002 or	UN5116-X	DIGI TRANSISTOR		
Q7003	DTA143TUA-X	DIGI TRANSISTOR		
Q7003 or	UN5116-X	DIGI TRANSISTOR		
Q7004	DTA143TUA-X	DIGI TRANSISTOR		
Q7004 or	UN5116-X	DIGI TRANSISTOR		
Q7005	DTA143TUA-X	DIGI TRANSISTOR		
Q7005 or	UN5116-X	DIGI TRANSISTOR		
Q7006	DTC143TUA-X	DIGI TRANSISTOR		
Q7006 or	UN5216-X	DIGI TRANSISTOR		
Q7007	DTC143TUA-X	DIGI TRANSISTOR		
Q7007 or	UN5216-X	DIGI TRANSISTOR		
Q7008	DTC143TUA-X	DIGI TRANSISTOR		
Q7008 or	UN5216-X	DIGI TRANSISTOR		
Q7009	DTC143TUA-X	DIGI TRANSISTOR		
Q7009 or	UN5216-X	DIGI TRANSISTOR		
Q7010	DTC143TUA-X	DIGI TRANSISTOR		
Q7010 or	UN5216-X	DIGI TRANSISTOR		
Q7011	DTC143TUA-X	DIGI TRANSISTOR		
Q7011 or	UN5216-X	DIGI TRANSISTOR		
Q7012	DTC143TUA-X	DIGI TRANSISTOR		
Q7012 or	UN5216-X	DIGI TRANSISTOR		
D2251	1SS133-T2	SI DIODE		
D2251 or	1SS270A-T2	SI DIODE		
D3001	LNB2301L01VI	LED		
D3002	1SS133-T2	SI DIODE		
D3002 or	1SS270A-T2	SI DIODE		
D3005	11ES2-T2	SI DIODE		
D3005 or	1A3G-T2	SI DIODE		
D3016	MTZJ3.9B-T2	Z DIODE		
D3016 or	RD3.9ES/B2/-T2	Z DIODE		
D5001	S1WB/A/60-4102	BRIDGE DIODE		
D5001 or	S1WB/A/60-X	BRIDGE DIODE		
D5001 or	S1WB(A)60F4072X	BRIDGE DIODE		
D5101	AU01-T2	SI DIODE		
D5101 or	1SR153-400-T2	FR DIODE		
D5101 or	ERA18-04-T2	FR DIODE		
D5101 or	10ELS4-T2	FR DIODE		
D5102	11ES2-T2	SI DIODE		
D5102 or	1A3G-T2	SI DIODE		
D5102 or	ERA15-02-T2	SI DIODE		
D5103	1SS133-T2	SI DIODE		
D5103 or	1SS270A-T2	SI DIODE		
D5105	1SS133-T2	SI DIODE		
D5105 or	1SS270A-T2	SI DIODE		
D5203	AU01Z-T2	FR DIODE		
D5203 or	10ELS2-T2	FR DIODE		
D5204	AU01Z-T2	FR DIODE		
D5204 or	10ELS2-T2	FR DIODE		
D5207	AK04-T2	SB DIODE		
D5207 or	11EQS04-T2	SB DIODE		
D5207 or	1S4-T2	SB DIODE		
D5207 or	SBO40-T2	SB DIODE		
D5210	AU01Z-T2	FR DIODE		
D5210 or	ERA18-02-T2	FR DIODE		
D5210 or	1SR153-400-T2	FR DIODE		
D5210 or	10ELS2-T2	FR DIODE		
D5210 or	PG104RS-T2	FR DIODE		
D5301	MTZJ15C-T2	Z DIODE		
D5301 or	RD15ES/B3/-T2	Z DIODE		
D5302	MTZJ12A-T2	Z DIODE		
D5302 or	RD12ES/B1/-T2	Z DIODE		
D5303	MTZJ5.6A-T2	Z DIODE		
D5303 or	RD5.6ES/B1/-T2	Z DIODE		
D5305	MTZJ5.6C-T2	Z DIODE		
D5305 or	RD5.6ES/B3/-T2	Z DIODE		
D6002	HZ30-2L-T2	Z DIODE		

⚠ Symbol No.	Part No.	Part Name	Description	Local
D6002	or HZ30-2LTD	Z DIODE (M)		
PC3001	RPI-304J	IC(PHOTO SENSOR)		
PC3002	RPI-304J	IC(PHOTO SENSOR)		
⚠ PC5101	PC817X	IC(PHOTO COUPLER)		
C1	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C2	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C3	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C4	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C5	QEKC0JM-476Z	E CAPACITOR	47uF 6.3V M	
C6	QCBB1HK-103Y	C CAPACITOR	0.01uF 50V K	
C7	NCB21HK-471X	C CAPACITOR	470pF 50V K	
C7	NDC31HJ-471C	C CAPACITOR	470pF 50V J	
C8	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C9	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C10	NDC21HJ-151X	C CAPACITOR	150pF 50V J	
C11	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C12	NDC21HJ-330X	C CAPACITOR	33pF 50V J	
C14	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C15	NCF21CZ-105X	C CAPACITOR	1uF 16V Z	
C16	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C17	QEKJ1HM-335Z	E CAPACITOR	3.3uF 50V M	
C19	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C20	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C21	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C22	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C23	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C24	QCFB1HZ-104Y	C CAPACITOR	0.1uF 50V Z	
C25	NDC21HJ-5R0X	C CAPACITOR	5pF 50V J	
C26	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C27	NCB21EK-223X	C CAPACITOR	0.022uF 25V K	
C28	QEKJ1HM-335Z	E CAPACITOR	3.3uF 50V M	
C29	NCB21HK-472X	C CAPACITOR	4700pF 50V K	
C30	QEKJ1HM-474Z	E CAPACITOR	0.47uF 50V M	
C31	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C32	QDYB1CM-103Y	C CAPACITOR	0.01uF 16V M	
C33	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C34	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C35	NCB21EK-333X	C CAPACITOR	0.033uF 25V K	
C36	QEKJ1EM-475Z	E CAPACITOR	4.7uF 25V M	
C37	QERF0JM-476Z	E CAPACITOR	47uF 6.3V M	
C38	QERF0JM-476Z	E CAPACITOR	47uF 6.3V M	
C39	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C40	QERF1CM-106Z	E CAPACITOR	10uF 16V M	
C51	QERF1HM-105Z	E CAPACITOR	1uF 50V M	
C62	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C120	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C144	NCB21HK-102X	C CAPACITOR	1000pF 50V K	
C201	QERF0JM-476Z	E CAPACITOR	47uF 6.3V M	
C202	NCB21EK-223X	C CAPACITOR	0.022uF 25V K	
C203	QERF1HM-105Z	E CAPACITOR	1uF 50V M	
C205	NDC21HJ-101X	C CAPACITOR	100pF 50V J	
C207	NCF21CZ-105X	C CAPACITOR	1uF 16V Z	
C901	QETN0JM-477Z	E CAPACITOR	470uF 6.3V M	
C904	NCB21HK-102X	C CAPACITOR	1000pF 50V K	
C2001	QERF1EM-475Z	E CAPACITOR	4.7uF 25V M	
C2002	QERF1HM-105Z	E CAPACITOR	1uF 50V M	
C2003	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C2005	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2006	NCB21HK-123X	C CAPACITOR	0.012uF 50V K	
C2007	QEKJ1CM-226Z	E CAPACITOR	22uF 16V M	
C2008	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2009	NCB21HK-102X	C CAPACITOR	1000pF 50V K	
C2010	NCB21HK-152X	C CAPACITOR	1500pF 50V K	
C2011	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2012	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2051	QCBB1HK-331Y	C CAPACITOR	330pF 50V K	
C2052	QFLC1HJ-823Z	M CAPACITOR	0.082uF 50V J	
C2053	NCB21HK-472X	C CAPACITOR	4700pF 50V K	
C2054	NCB21EK-223X	C CAPACITOR	0.022uF 25V K	
C2055	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2201	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2202	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2203	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2204	QEKJ0JM-336Z	E CAPACITOR	33uF 6.3V M	
C2205	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2206	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2207	NCB21HK-153X	C CAPACITOR	0.015uF 50V K	
C2208	NCB21HK-153X	C CAPACITOR	0.015uF 50V K	
C2209	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2210	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2211	QEKJ0JM-336Z	E CAPACITOR	33uF 6.3V M	
C2212	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C2214	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2215	QEKC1EM-106Z	E CAPACITOR	10uF 25V M	
C2216	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C2218	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2219	QEKJ1CM-226Z	E CAPACITOR	22uF 16V M	
C2220	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2221	NCB21EK-223X	C CAPACITOR	0.022uF 25V K	
C2222	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C2251	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C2252	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C2253	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C2254	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C2255	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C2256	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C2257	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C2259	QEKJ1HM-334Z	E CAPACITOR	0.33uF 50V M	
C3004	NDC21HJ-101X	C CAPACITOR	100pF 50V J	
C3008	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C3011	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C3016	NDC21HJ-180X	C CAPACITOR	18pF 50V J	
C3017	NDC21HJ-220X	C CAPACITOR	22pF 50V J	
C3029	NCF21CZ-105X	C CAPACITOR	1uF 16V Z	
C3029	NCF31AZ-105X	C CAPACITOR	1uF 10V Z	
C3035	NCB21EK-223X	C CAPACITOR	0.022uF 25V K	
C3036	QERF0JM-107Z	E CAPACITOR	100uF 6.3V M	
C3049	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C3052	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C3053	QDYB1CM-103Y	C CAPACITOR	0.01uF 16V M	
C3056	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C3071	QEKJ1CM-336Z	E CAPACITOR	33uF 16V M	
C4001	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C4002	QERF1HM-105Z	E CAPACITOR	1uF 50V M	
C4004	QERF1AM-336Z	E CAPACITOR	33uF 10V M	
C4007	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C4009	NCB21HK-102X	C CAPACITOR	1000pF 50V K	
C4010	QERF0JM-476Z	E CAPACITOR	47uF 6.3V M	
C4011	NCB21CK-224X	C CAPACITOR	0.22uF 16V K	
C4014	NDC21HJ-101X	C CAPACITOR	100pF 50V J	
C4019	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C4031	QEKJ1CM-336Z	E CAPACITOR	33uF 16V M	
⚠ C5001	QFZ9072-683	MM CAPACITOR	0.068uF AC250V K	
⚠ C5003	QCZ9072-101	C CAPACITOR	100pF	
⚠ C5004	QCZ9119-472	C CAPACITOR	4700pF	
C5006	QETM2DM-476	E CAPACITOR	47uF 200V M	
C5101	QCZ0212-472	C CAPACITOR	4700pF 1kV K	
C5102	QCZ0339-151Z	C CAPACITOR	150pF	
C5104	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C5105	QFN31HJ-183Z	M CAPACITOR	0.018uF 50V J	
C5107	QFV11HJ-104Z	MF CAPACITOR	0.1uF 50V J	
C5202	QETN1CM-477Z	E CAPACITOR	470uF 16V M	
C5203	QETN1AM-108Z	E CAPACITOR	1000uF 10V M	
C5204	QETJ2AM-475Z	E CAPACITOR	4.7uF 100V M	
C5301	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C5302	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C5303	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C5305	QFVF1HJ-104Z	MF CAPACITOR	0.1uF 50V J	
C6501	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C6502	QEKC1EM-106Z	E CAPACITOR	10uF 25V M	
C6503	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C6504	QCFB1HZ-104Y	C CAPACITOR	0.1uF 50V Z	
C6505	QEKJ1HM-335Z	E CAPACITOR	3.3uF 50V M	
C6508	NCB21EK-223X	C CAPACITOR	0.022uF 25V K	
C6509	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C6512	NCB21EK-223X	C CAPACITOR	0.022uF 25V K	
C6513	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C6514	NCB21EK-223X	C CAPACITOR	0.022uF 25V K	
C6515	QEKC1HM-335Z	E CAPACITOR	3.3uF 50V M	
C6516	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C6517	NCB21CK-224X	C CAPACITOR	0.22uF 16V K	
C6531	NCB21HK-104X	C CAPACITOR	0.1uF 50V K	
C7011	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C7013	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	

⚠ Symbol No.	Part No.	Part Name	Description	Local
C7014	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
R1	NRSA02J-682X	MG RESISTOR	6.8kΩ 1/10W J	
R2	NRSA02J-152X	MG RESISTOR	1.5kΩ 1/10W J	
R3	NRSA02J-682X	MG RESISTOR	6.8kΩ 1/10W J	
R6	NRSA02J-273X	MG RESISTOR	27kΩ 1/10W J	
R7	NRSA02J-821X	MG RESISTOR	820Ω 1/10W J	
R49	NRSA02J-471X	MG RESISTOR	470Ω 1/10W J	
R76	QRE141J-562Y	C RESISTOR	5.6kΩ 1/4W J	
R77	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R90	NRSA02J-471X	MG RESISTOR	470Ω 1/10W J	
R93	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R104	NRSA02J-682X	MG RESISTOR	6.8kΩ 1/10W J	
R118	NRSA02J-222X	MG RESISTOR	2.2kΩ 1/10W J	
R201	NRSA02J-332X	MG RESISTOR	3.3kΩ 1/10W J	
R202	NRSA02J-222X	MG RESISTOR	2.2kΩ 1/10W J	
R901	NRSA02J-750X	MG RESISTOR	75Ω 1/10W J	
R904	QRE121J-331Y	C RESISTOR	330Ω 1/2W J	
R905	NRSA02J-101X	MG RESISTOR	100Ω 1/10W J	
R912	NRSA02J-750X	MG RESISTOR	75Ω 1/10W J	
R2003	NRSA02J-101X	MG RESISTOR	100Ω 1/10W J	
R2007	NRSA02J-123X	MG RESISTOR	12kΩ 1/10W J	
R2010	NRSA02J-123X	MG RESISTOR	12kΩ 1/10W J	
R2013	NRSA02J-682X	MG RESISTOR	6.8kΩ 1/10W J	
R2014	NRSA02J-224X	MG RESISTOR	220kΩ 1/10W J	
R2015	NRSA02J-221X	MG RESISTOR	220Ω 1/10W J	
R2016	NRSA02J-473X	MG RESISTOR	47kΩ 1/10W J	
R2017	NRSA02J-153X	MG RESISTOR	15kΩ 1/10W J	
R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R2053	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R2054	NRSA02J-123X	MG RESISTOR	12kΩ 1/10W J	
R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω 1/10W J	
R2056	QRE141J-820Y	C RESISTOR	82Ω 1/4W J	
R2057	NRSA02J-473X	MG RESISTOR	47kΩ 1/10W J	
R2058	NRSA02J-183X	MG RESISTOR	18kΩ 1/10W J	
R2059	NRSA02J-473X	MG RESISTOR	47kΩ 1/10W J	
R2060	NRSA02J-183X	MG RESISTOR	18kΩ 1/10W J	
R2201	NRSA02J-473X	MG RESISTOR	47kΩ 1/10W J	
R2202	NRSA02J-682X	MG RESISTOR	6.8kΩ 1/10W J	
R2205	NRSA02J-473X	MG RESISTOR	47kΩ 1/10W J	
R2206	NRSA02J-682X	MG RESISTOR	6.8kΩ 1/10W J	
R2209	NRSA02J-101X	MG RESISTOR	100Ω 1/10W J	
R2210	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R2211	NRSA02J-332X	MG RESISTOR	3.3kΩ 1/10W J	
R2212	NRSA02J-332X	MG RESISTOR	3.3kΩ 1/10W J	
R2213	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R2214	NRSA02J-101X	MG RESISTOR	100Ω 1/10W J	
R2215	QRE141J-221Y	C RESISTOR	220Ω 1/4W J	
R2216	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R2217	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R2218	NRSA02J-392X	MG RESISTOR	3.9kΩ 1/10W J	
R2219	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R2220	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R2251	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R2252	NRSA02J-332X	MG RESISTOR	3.3kΩ 1/10W J	
R2253	NRSA02J-101X	MG RESISTOR	100Ω 1/10W J	
R2255	NRSA02J-273X	MG RESISTOR	27kΩ 1/10W J	
R2257	NRSA02J-684X	MG RESISTOR	680kΩ 1/10W J	
R3091	QRE141J-472Y	C RESISTOR	4.7kΩ 1/4W J	
R3092	QRE141J-472Y	C RESISTOR	4.7kΩ 1/4W J	
R3093	QRE141J-472Y	C RESISTOR	4.7kΩ 1/4W J	
R3094	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R3136	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J	
R3137	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3205	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3206	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3207	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3208	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3209	QRE141J-181Y	C RESISTOR	180Ω 1/4W J	
R3211	NRSA02J-183X	MG RESISTOR	18kΩ 1/10W J	
R3212	NRSA02J-121X	MG RESISTOR	120Ω 1/10W J	
R3213	NRSA02J-183X	MG RESISTOR	18kΩ 1/10W J	
R3214	NRSA02J-121X	MG RESISTOR	120Ω 1/10W J	
R3215	NRSA02J-183X	MG RESISTOR	18kΩ 1/10W J	
R3216	NRSA02J-474X	MG RESISTOR	470kΩ 1/10W J	
R3217	NRSA02J-334X	MG RESISTOR	330kΩ 1/10W J	
R3219	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3220	NRSA02J-562X	MG RESISTOR	5.6kΩ 1/10W J	
R3222	NRSA02J-471X	MG RESISTOR	470Ω 1/10W J	
R3223	NRSA02J-105X	MG RESISTOR	1MΩ 1/10W J	
R3224	NRSA02J-101X	MG RESISTOR	100Ω 1/10W J	
R3226	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3227	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3237	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R3238	NRSA02J-472X	MG RESISTOR	4.7kΩ 1/10W J	
R3242	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R3243	NRSA02J-681X	MG RESISTOR	680Ω 1/10W J	
R3244	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R3245	NRSA02J-682X	MG RESISTOR	6.8kΩ 1/10W J	
R3252	NRSA02J-153X	MG RESISTOR	15kΩ 1/10W J	
R3253	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R4001	QRE141J-222Y	C RESISTOR	2.2kΩ 1/4W J	
R4002	NRSA02J-562X	MG RESISTOR	5.6kΩ 1/10W J	
R4010	NRSA02J-471X	MG RESISTOR	470Ω 1/10W J	
R4011	NRSA02J-471X	MG RESISTOR	470Ω 1/10W J	
R4012	NRSA02J-153X	MG RESISTOR	15kΩ 1/10W J	
R4018	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R4019	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
⚠ R5001	QRZ9046-475Z	C RESISTOR	4.7MΩ 1/2W K	
R5101	NRSA02J-224X	MG RESISTOR	220kΩ 1/10W J	
R5101	NRSA02J-224C	MG RESISTOR	220kΩ 1/10W J	
R5102	NRSA02J-224X	MG RESISTOR	220kΩ 1/10W J	
R5103	NRSA02J-683X	MG RESISTOR	68kΩ 1/10W J	
R5104	QRG02GJ-683	OMF RESISTOR	68kΩ 2W J	
R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω 1W J	
R5107	QRE123J-331X	C RESISTOR	330Ω 1/2W J	
R5108	NRSA02J-122X	MG RESISTOR	1.2kΩ 1/10W J	
R5109	QRE141J-681Y	C RESISTOR	680Ω 1/4W J	
R5110	NRSA02J-224X	MG RESISTOR	220kΩ 1/10W J	
R5112	NRSA02J-221X	MG RESISTOR	220Ω 1/10W J	
R5302	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R5303	NRSA02J-122X	MG RESISTOR	1.2kΩ 1/10W J	
R5304	QRE141J-471Y	C RESISTOR	470Ω 1/4W J	
R5306	NRSA02J-181X	MG RESISTOR	180Ω 1/10W J	
R5306	NRSA02J-181C	MG RESISTOR	180Ω 1/10W J	
R5310	NRSA02J-103C	MG RESISTOR	10kΩ 1/10W J	
R5310	NRSA63J-103C	MG RESISTOR	10kΩ 1/16W J	
R5312	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R5313	NRSA02J-821X	MG RESISTOR	820Ω 1/10W J	
R6020	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R6021	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R6030	NRSA02J-332X	MG RESISTOR	3.3kΩ 1/10W J	
R6031	NRSA02J-0R0X	MG RESISTOR	0Ω 1/10W J	
R6054	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R6502	NRSA02J-332X	MG RESISTOR	3.3kΩ 1/10W J	
R7001	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R7002	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R7003	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R7004	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R7005	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R7006	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R7007	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R7020	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R7022	NRSA02J-122X	MG RESISTOR	1.2kΩ 1/10W J	
R7023	NRSA02J-182X	MG RESISTOR	1.8kΩ 1/10W J	
R7024	NRSA02J-222X	MG RESISTOR	2.2kΩ 1/10W J	
R7030	NRSA02J-103X	MG RESISTOR	10kΩ 1/10W J	
R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ 1/10W J	
R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ 1/10W J	
R7033	NRSA02J-222X	MG RESISTOR	2.2kΩ 1/10W J	
VR4028	QVP0039-103Z	TRIM RESISTOR	SW. POINT 10kΩ	
L1	QQL29BJ-100Z	P COIL	10uH J	
L3	QQL29BJ-100Z	P COIL	10uH J	
L4	QQL29BJ-100Z	P COIL	10uH J	
L5	QQL29BJ-100Z	P COIL	10uH J	
L11	QQL01BJ-120Z	P COIL	12uH J	
L203	QQL231J-4R7Y	COIL	4.7uH J	
L901	QQL29BJ-100Z	P COIL	10uH J	
L2251	QQL29BJ-100Z	P COIL	10uH J	
L5201	PELN1184	CHOKE COIL		
L5202	PELN1184	CHOKE COIL		
T2051	PELN0832	OSC TRANS		
⚠ T5001	QQS0186-001	SW TRANSF		

⚠ Symbol No.	Part No.	Part Name	Description	Local
⚠ CD1	QMPD340-165-K	POWER CORD(US/CA)	1.65m BLACK	
CN1	QGF1201C2-09	CONNECTOR	FFC/FPC (1-9)	
CN2001	QGF1201C2-06	CONNECTOR	FFC/FPC (1-6)	
CN2002	QGB2532J1-02	CONNECTOR	B-B (1-2)	
CN3001	QGB2032M4-12	CONNECTOR	B-B (1-12)	
DI7001	LTG-Y2K12M-01J	LED		
⚠ F5001	QMF51N2-1R25J1	FUSE	1.25A AC250V	
FC5001	QNG0006-001Z	FUSE CLIP		
FC5002	QNG0006-001Z	FUSE CLIP		
J2	QNN0286-002	PIN JACK	A/V OUT	
J7101	QNN0524-002	PIN JACK	FRONT IN	
JS3001	QSW0954-002	ROTARY ENCODER		
K5101	QQR0678-001Z	FERRITE BEADS		
⚠ LF5002	QQR0532-001	LINE FILTER		
S3001	QSW0602-004	PUSH SWITCH	REC SAFETY	
S7002	QSW0456-002Z	TACT SWITCH	POWER	
S7004	QSW0456-002Z	TACT SWITCH	REW/CH-	
S7006	QSW0456-002Z	TACT SWITCH	FF/CH+	
S7008	QSW0456-002Z	TACT SWITCH	REC	
S7010	QSW0456-002Z	TACT SWITCH	PAUSE/CH	
S7011	QSW0456-002Z	TACT SWITCH	PLAY	
S7013	QSW0456-002Z	TACT SWITCH	STOP/EJECT	
SD1	LP21098-001B	SHIELD CASE(PRE)		
⚠ TB1	LP21082-001D	TERMINAL BOARD		
TU6001	QAU0302-001	TUNER		
⚠ VA5001	QAF0023-431Z	VARISTOR	430V	
X2	QAX0575-001	CRYSTAL		
X3001	QAX0728-001	CRYSTAL		
OT1	LP31037-001B	FPC HOLDER(U)		
OT2	LP31038-001A	FPC HOLDER(L)		

A/C HEAD BOARD ASSEMBLY <12>

⚠ Symbol No.	Part No.	Part Name	Description	Local
PW1	LPA10158-01A1	A/C HEAD BOARD ASSY		

LOADING MOTOR BOARD ASSEMBLY <55>

⚠ Symbol No.	Part No.	Part Name	Description	Local
PW1	LPA10158-01A2	L.MOTOR BOARD ASSY		